University of Texas Bulletin

No. 1853: September 20, 1918

READING IN A TEXAS CITY
DIAGNOSIS AND REMEDY

By

S. M. LLOYD

Principal, Baker School, Austin

And

C. T. GRAY

Associate Professor of the Philosophy of Education

Education Series No. 4

PUBLISHED BY
THE UNIVERSITY OF TEXAS
AUSTIN

Publications of the University of Texas

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B204-620-2m-L

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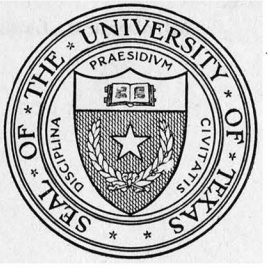

PUBLISHED BY THE UNIVERSITY SIX TIMES A MONTH, AND ENTERED AS SECOND-CLASS MATTER AT THE POSTOFFICE AT AUSTIN, TEXAS. UNDER THE ACT OF AUGUST 24, 1912

The benefits of education and of useful knowledge, generally diffused through a community, are essential to the preservation of a free government.

Sam Houston

Cultivated mind is the guardian genius of democracy. . . . It is the only dictator that freemen acknowledge and the only security that freemen desire.

Mirabeau B. Lamar

AUTHORS' PREFACE

This bulletin has been prepared with the elementary school teachers of Texas especially in mind. For this reason, it was thought best to include a discussion of reading tests as found in Chapter I. The methods used in Chapter II are similar to those used by other investigators. The results recorded in this chapter will probably be of interest to students of education only in so far as they furnish data from another city. The contribution of the study is included in Chapters V and VI. It is felt that the practicability of the method as set forth in these chapters has been demonstrated and that it can be employed by teachers in service.

Acknowledgments are due to Superintendent A. N. McCallum for granting the opportunity for this study and for his encouragement; to the principals in whose schools the remedial work was carried on, for their cordial co-operation; and to the teachers of the special groups, without whose interested and discriminating work the study would have been much less successful.

Our thanks are also due Miss Casse Paul for her careful tests of eye-movements, and to Miss J. I. Eidson, who gave oral tests to a number of children in a very careful and accurate manner.

S. M. LLOYD.
C. T. GRAY.

Austin, May 1, 1920.

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INTRODUCTION

This is a study of reading in the white public schools of Austin, Texas. Austin is a city of about 40,000 inhabitants. The average number of children enrolled in the white schools for the last two years was 5350. Of this number about 3600 attended the nine elementary schools, and the remaining pupils attended the two high schools. In each of the elementary schools there are six grades, while all the seventh grade pupils in the city attend the Allan High School, a junior high school composed of the seventh and eighth grades. The work of the first four grades of the elementary schools is done by room-teachers who teach all the subjects for their respective grades, while the work of grades five and six is conducted upon a departmental basis. Each elementary school has a principal, a large part of whose time is devoted to supervision. Up to the year of this investigation, there was no supervision which would affect the work in reading, save that of the principals and that which was carried on from the superintendent's office. In that year a primary supervisor was employed.

A well prepared course of study in reading is in the hands of each teacher. In the preparation of this course, the teachers and principals have had an important part, and in carrying it out the teachers are allowed a large amount of freedom for the development of individual methods and devices. For several years prior to and including 1918-19, the basic readers were the Hill Readers. These were supplemented by the Art Literature Readers in the first three grades and by the Elson Readers in all grades. In addition to these, each grade in the elementary schools, except the sixth, used two other supplementary readers. Though all of the elementary schools have libraries, few of them contain many books, and these are generally of a character suitable only for upper grade pupils.

The average time in minutes per week devoted to reading in the various school grades is listed below.

Grade	Minutes per Week
3	300
4	150
5	150
6	150

The investigation as carried out involved two problems: the analysis of the condition of reading as one of the subjects of instruction in the system, and the diagnosis of the reading ability of poor readers in the various grades, together with the prescription of such remedial training as was indicated by the diagnosis.

In studying the first problem, the product of reading instruction was measured by means of one of the standardized tests in silent reading. This allowed a comparison of the record of the city with established standards, a comparison which pointed out the weak places and indicated changes needed in instruction. This survey also furnished data for a comparison of school with school and grade with grade, and established a norm for the city as a basis for judging the efficiency of the individual schools.

In dealing with the second problem, a number of poor readers in the various classes, who were discovered through the returns of the silent reading test given to all pupils in the city, were made the subjects of further study. Their weaknesses were analyzed by means of other tests, and suitable remedial training was given to them. This required, first, the development of a technique of individual diagnosis practicable in a public school system, and a method of remedy which could be employed in regular class room instruction. Several successful methods of diagnosis and remedial treatment have been devised in training schools, and the published accounts of these were consulted for guidance and authority. So far as is known, however, no such work as the present has been done in a public school system, and the results of this investigation are offered in the hope that they may make easier the solution of the difficulties of individual readers in the ordinary school room.

CHAPTER I

AVAILABLE TESTS

In order to choose methods and devices suitable for a diagnostic survey, it became necessary to examine with some degree of thoroughness most of the tests for reading now in use. This was true of oral tests as well as silent, for it was recognized that the oral tests would be indispensable in the matter of individual diagnosis. It is the purpose of the present chapter to discuss the advantages and disadvantages of each test as it relates to the problem of diagnosis. Methods of investigating eye-movements and perception during reading, along with other observations which it is possible to make concerning the reading activity, are also treated in this chapter.

Oral Reading Tests

Two tests for oral reading were considered. These were the test formulated by Superintendent Price of Enid, Oklahoma, and that by W. S. Gray of the University of Chicago.

The Price Test The Price (11) test consists of two selections for each grade, one to be given at the first of the term and one later. The test is easy to give and to score, but there were discovered several disadvantages, which led to its rejection. In the first place, no standards are published. Moreover, the steps in difficulty between the passages for the different grades have not been estimated, or, if they have, no discussion of the scaling has been given. It appears that an undue emphasis is given to rate, for the directions furnished the pupils indicate that the test is given to determine how rapidly and accurately they can read. The direction for rapidity does not seem a wise direction for oral reading, since there are vocal and aural limits to rate in oral reading. Such a direction is contrary to the practice of the class room, for there the pupil is frequently warned against reading too fast. Repetitions are not counted as errors, contrary to the practice of most investigators and teachers, because the author considers that the mark against repetition will appear in the lowered rate.

The Gray Test The Gray (6) test is the one used in the survey of the Cleveland schools. The same test has also been used in testing children in St. Louis and in a number of Illinois cities.

Because of this wide use, reliable standards are available for purposes of comparison. In evolving this test Gray used thorough scientific care. He first chose from various school readers sixty paragraphs about fifty words in length, containing complete thought units adapted to the interests of children. From these, sixteen were chosen as representing a series of varying degrees of difficulty. These sixteen were submitted to twenty graduate students and ranked in order of difficulty. The value of the separate steps of difference was computed by comparing the frequency of judgments. After dropping several paragraphs which were judged of equal difficulty, and after adding two new paragraphs to fill in steps of too great difference, Gray gave the test to forty pupils. The data from this experiment caused changes in the order to be made and four more difficult passages to be added. The test was then given to 565 pupils, grades III to VIII. The paragraphs were scaled according to the method followed by Buckingham in preparing his spelling tests. By this method ten paragraphs which represented nearly equal steps of difficulty were chosen from the twenty. With two more paragraphs added to equalize more perfectly the steps of difficulty, the new test was given to 2000 pupils in Illinois schools, and the relative difficulty was again determined by the same method of scaling. After a change in the easier paragraphs had been made, the test was given in forty-four schools in Cleveland, and upon the data from 2193 pupils tested in these schools and 1106 pupils tested in the Illinois schools, the final distribution of the paragraphs was made.

From the same data were carefully worked out standards of excellence and the method of scoring by the pupil's ability to read paragraphs in accordance with these standards. The method of scoring does not take into consideration the relative importance of various types of errors. However, Gray considered this, but found that it was impossible to secure a system of weighting suitable to all grades, and that the use of any system of weighting was laborious and impracticable. One system of weighting which seemed satisfactory to a number of reading experts, when applied to the returns from the tests, gave results little different from the system of scoring adopted.

The Gray test was chosen for use in this investigation. In order

that the character of this test and method of scoring may be understood, a few of the exercises are given:

Once there were a cat and a mouse. They lived in the same house. The cat bit off the mouse's tail. "Pray, puss," said the mouse, "give me my long tail again."

"No," said the cat, "I will not give you your tail till you bring me some milk."

Once there lived a king and queen in a large palace. But the king and queen were not happy. There were no little children in the house or garden. One day, they found a poor little boy and girl at their door. They took them into the beautiful palace and made them their own. The king and queen were then happy.

The crown and glory of a useful life is character. It is the noblest possession of man. It forms a rank in itself, and estate in the general good will, dignifying every station and exalting every position in society. It exercises a greater power than wealth, and is a valuable means of securing honor.

In taking the test, the pupil reads the paragraphs from sheets prepared especially for reading. On these sheets the type for the earlier paragraphs is of a larger size than it is in the later. The one giving the test has before him a record sheet containing all the paragraphs. On this sheet he writes the name and grade of the pupil and records such other data as may be useful. He notes on each paragraph the time in seconds spent in reading it, and indicates the errors by appropriate marks. The errors recorded are mispronunciations, omissions, substitutions, insertions, and repetitions. In scoring, both errors and time are taken into account. For instance, a paragraph which requires forty or more seconds receives a score of *4* if not more than one error is made, *3* if two errors are made, *2* if three errors, *1* if four, and *0* when more than four errors are made. A paragraph read in not more than nineteen seconds will be scored *4* with as many as two errors, and will receive a score of *1* with as many as six errors. The score quantity for the number of errors varies between these two extremes in accordance with the time of reading. The pupil's full score in oral reading is found by multiplying the score for each paragraph by the value for that paragraph, finding the sum of these values, and dividing that sum by four. The value for all except two of the paragraphs is *5*. The eleventh paragraph has

a value of *10*, while the value of the first paragraph varies for the different grades, being *55* for the first grade and *5* for the eighth.

Silent Reading Tests

The Brown Test One of the most attractive of the several silent reading tests is the one formulated by Brown (1). The test is made up of a single narrative, neither very easy nor very difficult, which would be interesting to any child. The force of this interest is lost somewhat, however, because of the fact that the pupils are allowed to read for only one minute. They are then asked to write as much as they can remember of the matter read. This would seem to place some pupils at a disadvantage; for a pupil with a good mechanical memory, sheer retentive power, would make a better showing than an equally good, or better, reader who looks first for the point in the story, and whose memory of details would thus be organized around that unifying center. Of course, this criticism is somewhat weakened by the fact that a comparatively small amount of matter is read in one minute. The papers are scored upon the basis of the number of ideas reproduced. Scoring by means of reproduction is open to two objections. First, the pupil who has considerable language ability has a decided advantage over other pupils. The labor of writing a reproduction will consume most of the energy of those pupils who do not have a ready command of written composition. Such a method, although used by a number of investigators, seems to make the test a measure of language ability as much as a measure of comprehension. Besides, pupils are accustomed to the aid of questions in reproductions in the class room, and many pupils have not the thought initiative to do themselves justice without this aid. Secondly, the scoring of these reproductions will be variable. This variability, however, is lessened in the case of the Brown test by means of a key which lists the separate ideas. But even with that, there still remains a large subjective element in the scoring. Brown has made an ingenious attempt to formulate a unit of reading efficiency which combines both rate and comprehension. Such a unit is needed for purposes of comparison, and although his unit has been criticised because it is artificial and there is no data to determine its reliability, it appears that its use would be thoroughly practicable. The principal objections to the use of the Brown test are

the labor of scoring the reproductions and the fact that only one selection is used. In an ideally graded school system, the only difference a single selection would show between the upper and the lower grades would be in the quantity read and the language ability necessary for reproduction. The matter used in the test is so easy to understand that, after the lower grades are past, the test is no measure of comprehension beyond the extra amount read.

The Starch Test The test devised by Starch (12) was next examined. Like the Brown (1) test, it uses reproduction as a measure of comprehension. Starch has made the scoring of the reproduction somewhat objective, however, by having the remaining words of the reproduction counted after the words which do not exactly produce the though are stricken out. The score is expressed as the ratio which the number of words counted bears to the number of words in the original. Starch has shown by experiment that this method of scoring is closely comparable in results to the idea-counting method. This would still leave a variable factor in the scoring because of the difference of opinion as to what words should be omitted. The test obviates one of the disadvantages of the Brown (2) test by using different selections for different grades.

The Courtis Test Another test has been devised by Courtis (3). He, too, uses a single selection for grades II to VI, as did Brown, but his selection seems easier than Brown's and does not appear to have the same universal interest. The comprehension is measured by answers to questions. These questions are direct and easy and are to be answered by *yes* or *no*. Such an arrangement requires little language ability on the part of pupils. The test passage is to be read twice, once for speed and a second time paragraph by paragraph for the purpose of answering questions after each paragraph. This introduces a new element, that of study. The study, however, will consist only in glancing over the paragraph, for the questions are easy. With the paragraph above the questions, some children of the hesitant type may waste time looking back over it; whereas if they did not have it before them, they would put the correct answer down and go on. One serious objection to the *yes* and *no* response is that a pupil might guess at every answer and get fifty per cent correct. Courtis seeks to provide for this by charging every mistake twice against the pupil.

Another objection is that the rate and the comprehension are not measured by the same reading. Some pupils might speed their reading beyond the comprehension point and still receive a good score in comprehension by the second reading. This gives an unfair advantage to the rapid reader. The directions prescribe that the pupils are to be allowed to read three minutes and are to be directed to mark the word on which their eyes rest at the command "mark," given at the end of every half minute. This command, it appears, would certainly affect the rate and, at least in the case of some pupils, introduce confusion.

The Fordyce Test The tests prepared by Fordyce (4) consist of two selections: one for grades III to V and another for grades VI to IX. No discussion has been given as to the difference in difficulty between the two passages. Fordyce has adopted the norms for speed determined by Starch (12) and others upon material different from that used in his tests. Speed is scored by Fordyce in percentages of these norms. For instance, the teacher in testing a grade allows the class to read a selection of 300 words for the number of seconds in which a selection of that length should be read by the grade in question, as estimated from these norms. At the end of that time the pupil marks the last word read and then proceeds to read the remaining portion. Pupils who have finished within that time or earlier are given a grade of 100 per cent. The grades of the other pupils are computed by dividing the number of words read by 300. This scheme makes no provision for finding the rate of the pupil whose ability exceeds that expressed by the figure of the norm. Moreover, such scoring gives the figures in a manner not so objective and easily understood as that in terms of the number of words per second. Fordyce's method of computing class efficiency seems open to serious objection. Arbitrarily, so far as can be seen from his descriptive folder, he says that well-taught pupils should have a record of 100 per cent in speed and 70 per cent in comprehension. From a sample record sheet, he chooses as the only efficient pupils of the class seven pupils who meet or exceed this standard, rejecting eight others with scores of 70, 80, and 90 in speed, and 100, 95, and 90, respectively, in comprehension. It would seem, on the face of the facts, that a pupil who read seventy lines and comprehended all in a given time was equal in reading ability to a

pupil who read one hundred lines and comprehended only seventy. If this is true, then the class whose efficiency Fordyce estimated to be 13 per cent (by dividing the enrollment, fifty-two, into seven) should be given an efficiency of 28 per cent. Of course, this criticism might be somewhat weakened if the material were the same as the Starch (12) material, and if it were known that the Starch norms were the *sine qua non* of reading ability, below which a reader to be called "good" could not fall in his silent reading, no matter how perfect his comprehension might be.

The Kelly Test "The Kansas Silent Reading Tests," devised by F. J. Kelly (9), have been used very extensively because of the ease with which they may be given and scored. They consist of three different tests: one for grades III, IV, and V; one for grades VI, VII, and VIII; and one for the high school grades. Because of their wide use, they have been thoroughly standardized, and the norms given as a basis for comparisons are highly reliable. The greatest objection to them is the nature of the material. It is not made up of usual reading material, but in a large degree is composed of puzzles and mathematical problems. The responses require very little writing and are made up of words, figures, and words to be underscored or encircled. Some of the directions are rather difficult to follow, and might cause a pupil to receive a low score, though he comprehended perfectly the sense of the passage. Furthermore, a pupil might not be able to solve the problem, though he understood thoroughly what the problem was. It is considered by those who have used these tests that, while they do not measure simple reading ability, the results make a fair estimate of reading ability. While this may be true in the case of whole classes or systems, it certainly does not appear that such tests would make a fair estimate in the difference of reading ability between individuals. Moreover, in a survey of reading in a school system, the examiner would feel more sure of his results when he measured reading ability isolated as nearly as possible from geographical or mathematical or other types of ability.

The Thorndike Test The tests formulated by Thorndike (13) comprise a series of selections in which the different grades of difficulty have been carefully evaluated. The tests are not hard to give, and the children respond by means of answers to questions. The pupils are allowed as much time as they wish to re-

read the passage and answer the questions. This brings in the element of study, which is not included in the ordinary acceptance of the word reading. The passages are of such a nature that by close study the pupil will be rewarded with a higher score. Thorndike takes no notice whatever of rate. This constitutes a serious inadequacy in tests which are to be used for the purpose of individual diagnosis, for speed in silent reading is a very important factor.

The Gray Test As in the case of the oral reading test, the silent reading test used by Gray (6) in the Cleveland survey was worked out with such scientific care and accuracy as to commend it highly to anyone who wishes a reliable measure of reading. Three selections of regularly increasing difficulty are used for the different groups of grades. The degrees of difficulty were carefully estimated from the results when the tests were given to a number of children. Gray tested experimentally the reliability of a single record for rate, and found a high degree of accuracy. Two methods of scoring comprehension were chosen: reproduction and answers to questions, since he found by actual testing that some pupils do well by one method and relatively poorly by the other. In an effort to make the scoring of reproduction as objective as possible, he adopted the word-counting method used by Starch (12). He was careful, as Starch had been, to compare his word-counting method with the idea-counting method, and found the results parallel, with the group-idea method a somewhat more severe method of scoring. There is no published list of answers to the questions; consequently the scoring would be variable to some extent. Since the tests have been used in the Cleveland and St. Louis schools and a number of others, the standards for comparison are excellent. The determining disadvantages of the tests for the purposes of this survey are the disadvantages which Gray himself recognizes for practical schoolroom purposes. The tests are given individually; consequently they take a great deal of time and effort, and only a small number of pupils can be tested in a limited time. Gray was able to test only a few out of each grade in Cleveland. While the results for the whole city would seem reasonably reliable, they would not, under these conditions, seem a fair estimate for any one class. Besides the objection to the

length of time required in giving the tests, the methods of scoring results are slow and laborious.

The Monroe Test The "Standardized Silent Reading Test," devised by W. S. Monroe (10), was finally selected. This series of tests is an outgrowth of and an improvement upon the Kelly tests. Monroe retained the ease of giving and scoring shown by the Kelly tests, but discarded the inappropriate material for matter much better suited to the purpose. The content of the exercises is taken from the field of general reading. Considerable care was used in formulating these tests. Three hundred exercises of suitable length were secured from school readers and other books. One hundred and fifty-seven of these, selected as most appropriate, were given as a test to a number of pupils, averaging one hundred and eighty-six to the exercise. The time for each reading was carefully noted, and the average number of seconds required to answer the question for each exercise correctly was calculated for each grade, to find the relative difficulty of the exercises. From this information was computed the comprehension value. The rate value was determined by counting the number of words in an exercise and dividing by five, the number of minutes allowed for giving the tests. This makes the total rate score the number of words per minute read by the pupil. Monroe (10) admits, however, that, since the material is not uniform in difficulty, this rate score will have only a general meaning. Three of the exercises, together with their rate and comprehension values, are presented:

In the western part of the United States there are large tracts of land known as deserts. On these deserts one may travel for scores of miles without seeing vegetation of any kind excepting cactus and scattered blades of grass.

Would you expect to find many trees in these deserts?

Rate value, 10. Comprehension value, 1.7.

The mother stork sat in her nest with her four little ones. At a little distance, on the top of the roof, stood the father stork. He held one leg up and stood on the other.

Where was the father stork?

Rate value, 8. Comprehension value, 2.0.

Six white eggs on a bed of hay,
Flecked with purple, a pretty sight!

There as the mother sits all day
Robert is singing with all his might.

The above lines of a poem tell about a bird's nest. Of what was this bird's nest made?

Rate value, 9. Comprehension value, 2.3.

These exercises belong to Form 1, Test 1, intended for grades III to V. There are two other forms, approximate to the first in value and difficulty, which may be used as follow up tests. Each form has a separate test for the different groups of grades—III-V, VI-VIII, and IX-XII—save the third form, which omits the last test. A pupil's rate score is computed by adding the rate values of every exercise read. The comprehension score is obtained by adding the comprehension values of all the exercises dealt with correctly. Fairly trustworthy standards have been established from the returns from several thousand pupils who have taken the tests. One objection to the test is that the rate score does not give the actual reading rate in words per second. As it is, the rate score can be used only for purposes of comparison. Another objection is that there is no method of indicating the ratio of comprehension. These objections are overbalanced by the facility with which the tests may be given and scored and by the appropriateness of the material.

Methods of Observing Eye-Movements and Tests of Perception

It has been frequently shown that habits of eye-movement have a vital bearing upon rate of reading. There are more movements to the line during oral reading than in the more rapid silent reading. Some silent readers are slow merely because they have carried over into their silent reading the eye-movement habits acquired in their oral practice. In other cases, numerous pauses or many regressive movements are indications of faulty word recognition.

There are two methods which may be used to investigate eye-movements. The more exact investigation is made by means of a photographic apparatus. This photographs a beam of light reflected from the subject's eyes while he is reading a given selection. This mechanism can be so arranged that the location of the points of fixation on the lines read can be shown in a permanent record. The other method is to count the movements of the eye in reading a line by means of a mirror held so that the reflection of the eyes

may be seen by the examiner. Such observations are easy to make with a little practice, and the conditions for the child tested may be made perfectly natural. Moreover, this latter method offers an excellent opportunity for observation of the pupil during reading. For these reasons it was decided to use this method of investigating the eye-movements of the individual pupils.

In any diagnosis of the reading difficulties of individual pupils, it is necessary also to secure data upon the span of perception, for the rate of reading is affected by the perceptual span. The greater span of perception is characteristic of the more rapid readers, and the smaller span of the slower readers. The perceptual span may be tested by means of a projection lantern fitted with a photographic shutter which will regulate the exposure to any fraction of a second desired. For such short exposure tests, sentences and phrases of from two to six words are flashed upon an appropriate surface. The subject reads and records as many of the words as he can at each exposure.

Another perception test is spoken of as the voice-eye separation test. It is carried out by having the child read orally a passage which is of average difficulty. At some word in the midst of the passage, which has been predetermined by the experimenter, a card is placed over the reading material so that it disappears from the view of the reader. The subject is expected to continue reading as far as possible after the card is in place. The number of words which the child is able to recite after the card is in place is spoken of as the voice-eye span.

Careful experiments have shown that a long span as exhibited in either of the two tests just mentioned is correlated with rapid reading.

The short exposure test is a group test and, for this reason, was selected for use in this investigation. However, if the simple form of apparatus required is not available, the voice-eye span test may well be used.

It is also possible to make other types of observations upon the reading activity. Among these are those concerned with the breathing coördinations in oral reading, with extraneous movements, and with vocalization in silent reading. In certain cases data upon these phases of reading ability throw helpful light upon some difficulties of children in their reading. For this reason, observations concerning them should be used in any diagnostic procedure.

CHAPTER II

MEASUREMENT OF THE AUSTIN SCHOOL SYSTEM

The Results of the Tests

During the week beginning January 20, the Monroe silent reading tests were given to all the white pupils in the schools of Austin in grades III, IV, V, VI, VII. The tests were conducted by a chosen teacher in each of the elementary schools. This teacher was the reading teacher of the department grades, the fifth and sixth, in all the schools except two. In these schools the tests were given by the principals. In the Allan High School the tests for the seventh grade were conducted by several teachers. It was felt that, in having the tests given by a small number who had been instructed beforehand, the conditions would be more uniform. The test papers were scored by the room teachers; but when upon examination it was found that the scorers had used varying standards, the papers were rescored by Mr. Lloyd and one assistant.

Table II gives the scores of the published norm, the median scores for the city of Austin, and those for the individual schools. The two right-hand columns under each grade give data for sections A and B, the low and high sections of the grade, respectively. In these columns the top figures on the line for each school refer to Section A, while the bottom figures refer to Section B. The left-hand column, of the two, shows the number of pupils taking the test, while the right-hand column gives the median score in comprehension for the section. Scores for the separate sections are furnished only in those cases where they are needed for later comparisons.

The Austin Norms

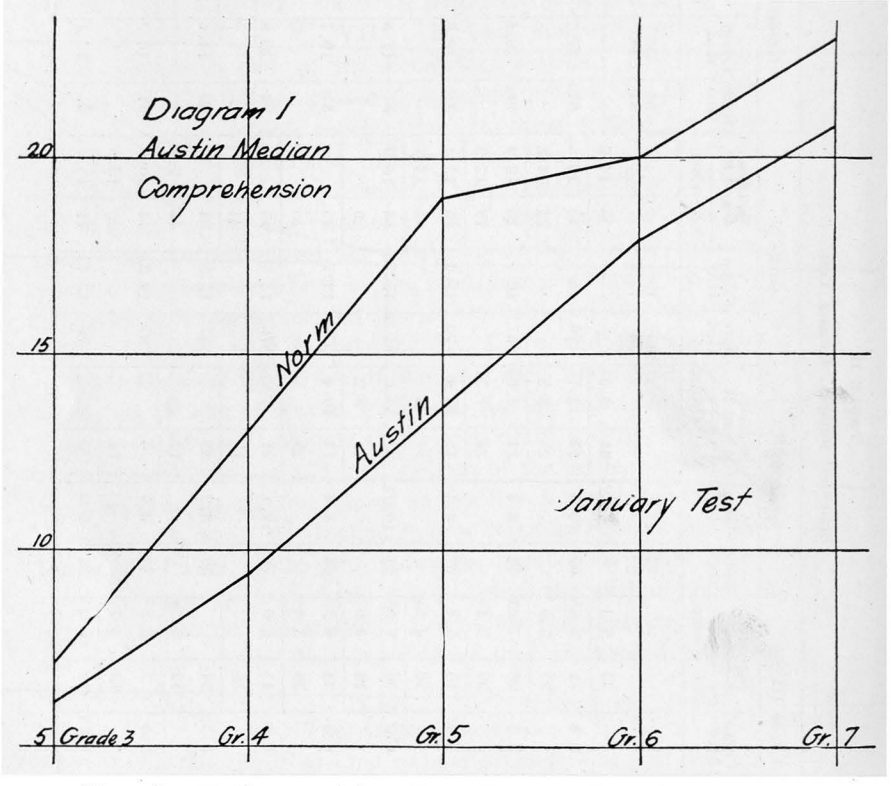
In order that the differences as shown by these scores may be more fully appreciated, graphs are furnished. Diagram I shows curves for the standard norm and the Austin norm in comprehension. It will be noted that the standard norm graph shows a regular curve of progress through the third, fourth, and fifth grades, with a decided drop in the upward movement between the fifth and sixth grades. This is accounted for by the change in test material at the sixth grade, the matter for Test II, which is pre-

TABLE II

Statistical Returns, January Test

	Grade III				Grade IV				Grade V				Grade VI				Grade VII	
	Rate Med.	Comp. Med.	Sections A and B		Rate Med.	Comp. Med.	Sections A and B		Rate Med.	Comp. Med.	Sections A and B		Rate Med.	Comp. Med.	Sections A and B		Rate Med.	Comp. Med.
			No.	Comp.			No.	Comp.			No.	Comp.			No.	Comp.		
Standard Scores	52	7.2	.....	.....	73	13	.....	.....	89	19	.....	.....	88	20	.....	.....	98	23
Austin Norm	44	6.15	.....	.....	67	9.45	.....	.....	76	13.7	.....	.....	81	18	.....	.....	98	20.8
			33	5.3			31	9.9			35	14.7			21			
School I	44	6.8	21	9.85	67	10.6	20	12.7	76	16	22	16	81	17.7	13	.....	.....	.....
			27	3.9			23	8.2			24	14.2			28			
School II	44	5.3	26	7.25	54	8.2	14	8.65	87	13.7	25	12.2	98	19.8	13	.....	.....	.....
			20	5.4			29	7.3			19	12.3			21			
School III	44	5.4	13	5.4	67	8.35	15	12.4	76	13.4	15	13.4	81	18.8	12	.....	.....	.....
			36	4.95			39	9			42	13.7			30			
School IV	44	6.0	30	7.95	67	10.75	33	14.6	81.5	15.35	34	18.0	81	17.8	26	.....	.....	.....
			18	4.0			21	8.2			29				24			
School V	52	6.9	34	8.5	54	8.6	14	10.4	76	13.7	25	.....	81	19.7	27	.....	.....	.....
			29	3.9			25				20				16			
School VI	44	4.0	15	5.9	76	12.1	21	.....	76	14.7	15	.....	98	20.8	7	.....	.....	.....
			35				15				24				28			
School VII	44	5.5	24	.....	59	8.2	35	.....	87	13.5	24	.....	69	14.6	21	.....	.....	.....
			12	3.35			14				16	7.75			8			
School VIII	44	4.0	7	5.3	44	6.5	0	.....	67	10.2	14	10.6	81	16.2	12	.....	.....	.....
			18	5.3			14				20	13.5			14			
School IX	44	5.35	12	6.9	54	6.9	0	.....	76	13.7	11	13.7	81	17.1	10	.....	.....	.....

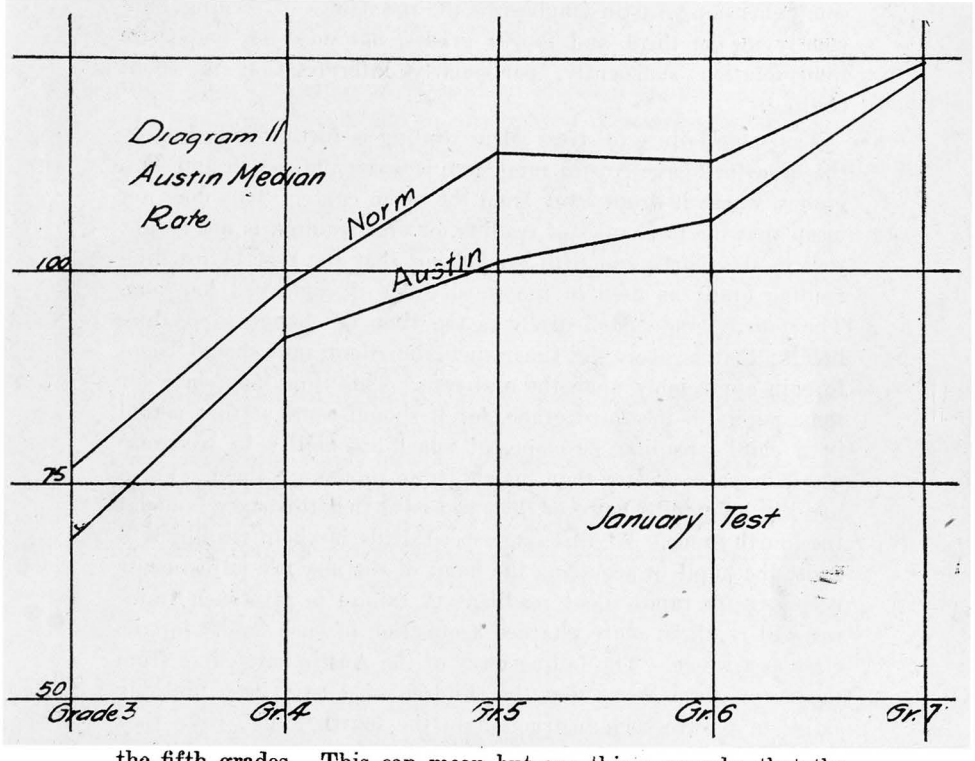
pared for the sixth, seventh, and eighth grades, being more difficult than that of Test I for the lower grades. The Austin curve is considerably below that of the norm throughout its entire extent. This was to be expected, for the Austin schools had been forced to close for two periods of five and three weeks each because of the influenza situation. The first intermission was from October 4 to



November 11, the second from December 13 to December 30. These two intermissions necessarily had a detrimental effect upon the regular work of the schools. How much of the difference is to be accounted for in this way cannot be determined. It seems safe to infer, however, that the greatest difference which can be ascribed to the broken school term is that shown in the third grade. The reading habits of third grade children are not so well established as are those of pupils in the higher grades, and a vacation would

consequently result in greater deficiency in reading ability for them than for older children.

If we grant that the comparatively poor score of the third grade is to be explained by the forced vacations, there are still other differences which must be accounted for. It will be noted that the difference between the two curves grows greater from the third to



the fifth grades. This can mean but one thing, namely, that the Austin school system does not succeed in developing as rapid growth in the ability to read for meaning as do the schools represented by the norm in grades III to V. This is doubtless because instruction in silent reading is not regularly and uniformly emphasized. The truth of this explanation is further attested by an examination of the rate curves for the norm and for Austin, shown in Diagram II. The fact that the rate curve for Austin gains slightly upon the norm curve between the third and the

fourth grades shows that the falling away in the comprehension curve between these grades is not due to an inferior advancement in the mechanics of reading, that is, in the ability to recognize words. This means that oral reading is taught as well in the third grade in Austin as in the third grades represented in the norms, and perhaps a little better. As shown by the two curves, rate and comprehension, Austin emphasizes the mechanics of reading sufficiently in the third and fourth grades, but does not emphasize interpretation sufficiently, particularly interpretation in silent reading.

The same failure to stress silent reading is further indicated by the behavior of the Austin rate curve between the fourth and fifth grades, where it drops away from the norm curve. This does not mean that the mechanics of reading, or oral reading, is not taught well in the fourth and fifth grades, but that the type of teaching reading orally as used in the third grade is continued too long. The fourth grade particularly is the time of change in reading habits; that is, it is the time when the silent rate should begin to gain appreciably upon the oral rate. This time may come for some pupils in the third grade, for it should come at that period in a child's reading development when his ability to recognize words becomes greater than his ability to pronounce them. For a majority of pupils, however, it is conceded that this stage is about the fourth grade. At this stage speed drills in silent reading will assist the pupil in acquiring the habit of the new eye adjustments necessary for rapid silent reading. A failure to give such training will result in more retarded acquisition of such habits for the class as a whole. The falling away of the Austin rate curve from the norm curve shows that the children of Austin have probably failed to receive such instruction in the fourth grade, since they have evidently not gained as much in silent speed as the children represented by the norm. In the light of these facts, it is evident that increased attention should be given to the teaching of silent reading in grades III, IV, and V. This means that appropriate emphasis should be given to both phases of such training, training for speed and for comprehension, and that a much greater quantity of matter should be read by the pupils.

This comparative loss in both comprehension and rate in the preceding grades is largely compensated for by an improvement

in the sixth grade. The Austin curves make sharp gains upon the norm curves between the fifth and sixth grades. This is explained by the different character of the studies in the fifth and sixth grades as compared to the grades below. In these two higher grades the pupil relies more upon the text than he does in the lower grades. Particularly is this true is geography, hygiene, and arithmetic. The character of work in reading is also different, for it is taught more and more as literature. This study of textbooks, together with an increasing amount of outside reading, reacts upon the pupils as instruction in silent reading, and their ability to read rapidly and to comprehend increases very satisfactorily. This gain in comprehension remains static up to the seventh grade as indicated by the practically parallel curves, but the gain in rate is shown to be increased by the converging rate curves between the sixth and seventh grades. It will be noted that the Austin curve for rate does not rise as sharply to the sixth grade, in comparison with the remaining portion of the curve and the norm curve, as does the Austin curve for comprehension. The indication here is that, while this study of texts gives a satisfactory improvement in interpretation, there is still some improvement to be desired in rate. Such an improvement would be gained by the speed drills of a wisely ordered instruction in silent reading, and by a greater quantity of silent reading in the fifth and sixth grades.

The idea may come to the minds of some that, since the curve for comprehension almost makes up between the fifth and sixth grades the loss it suffered between the third and fifth, there is no need to put greater emphasis upon silent reading in grades III to V. In this connection it may be argued, also, that the Austin curve is a much smoother curve than the norm curve and, therefore, represents a more normal type of learning progress. The answer to both these objections is that children with better silent reading ability in grades III to V will read more widely and more understandingly than others and will, consequently, have a richer and fuller mental life. Besides, they will be more likely to form early a taste for reading with its constantly increasing benefits throughout life.

The Place of Silent Reading

The place of emphasis upon silent reading is pointed out by the different stages in the process of learning to read. The first three

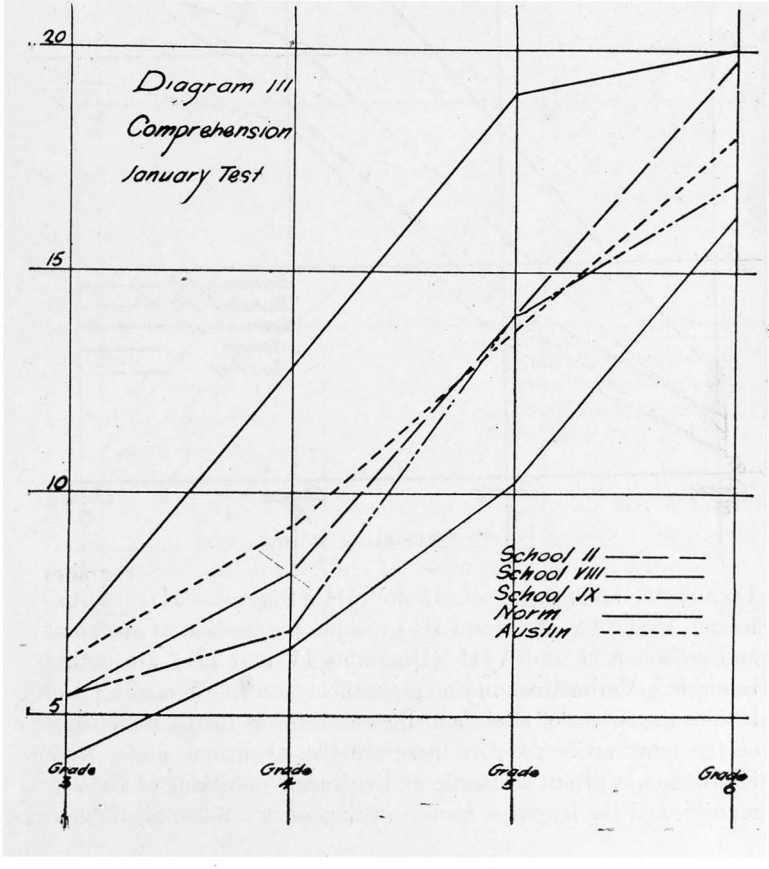
grades are necessarily devoted to the mechanics of reading. The attaching of meaning is, of course, to be carefully fostered from the introduction of the printed symbols in the first grade; but the words which are taught are those which are already in the child's vocabulary, and the main task of the teacher is to train the child to recognize words whose meaning he knows and which he already uses in oral speech. By the end of the third grade the pupil is expected to have acquired a reading vocabulary which embraces a majority of common words and the ability to read fluently selections of ordinary difficulty. The purpose of the next three grades is to increase that vocabulary beyond the bounds of the one he is accustomed to hear and use, and to give such training in the art of extracting meaning from the printed page that he will be able to apply this art independently to the work of the junior high school grades. Silent reading, then, should be emphasized in grades IV, V, and VI, just as oral reading was emphasized in grades I, II, and III. Training in silent reading for these grades should include training in both comprehension and speed.

However, training in silent reading should be undertaken before the fourth grade. The perfecting of the habits involved in fluent oral reading will be assisted by silent reading. Many teachers depend upon the sight reading of easy supplementary texts to develop this fluency; but, since the time for such oral sight reading is limited, it is easy to see that silent reading of similar material both in and out of school will be of great added benefit. Moreover, unless training in silent reading is undertaken before the fourth grade, there is danger that harmful mental habits may be formed which will retard growth in the art of reading for meaning. This danger arises from two natural tendencies. Some children find it difficult to free themselves from the necessity of speaking the word or hearing it spoken before translating it into meaning. This is demonstrated in the many cases of children in the upper grades whose silent reading shows strong motor characteristics. Other children have a tendency to become mere word callers, a tendency which will not be corrected through instruction in oral reading alone, even by a skillful and alert teacher. Both of these dangers will be lessened by a wise use of silent reading in grades II and III. By the end of the third grade, the pupil must not only have a reading vocabulary of common words, and the ability to read

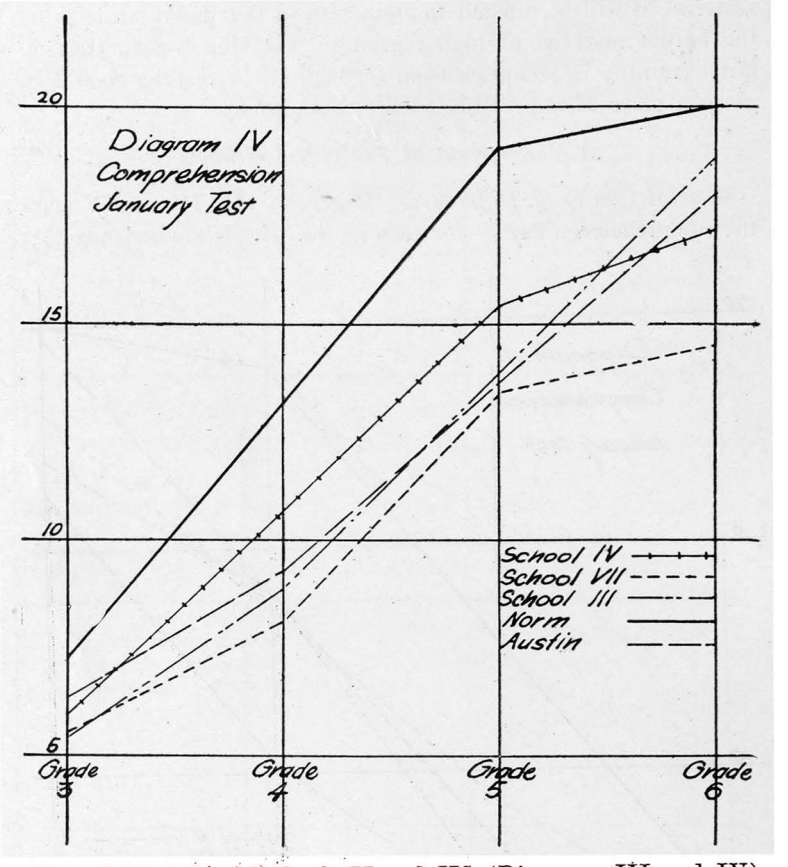
them fluently, but he must have the habit of reading for meaning. The material of the third grade is easy for him; there is hardly a word in his reader whose meaning he does not know. If he does not form the habit of reading for meaning when using this easy material, it will be difficult to train him in that habit while using the harder material of higher grades. For this reason, particularly, training in comprehension through silent reading should be given a place of importance in the third grade.

A Comparison of Individual Schools

General Causes of Differences Diagrams III, IV, and V show the comprehension curves for each of the schools studied, together

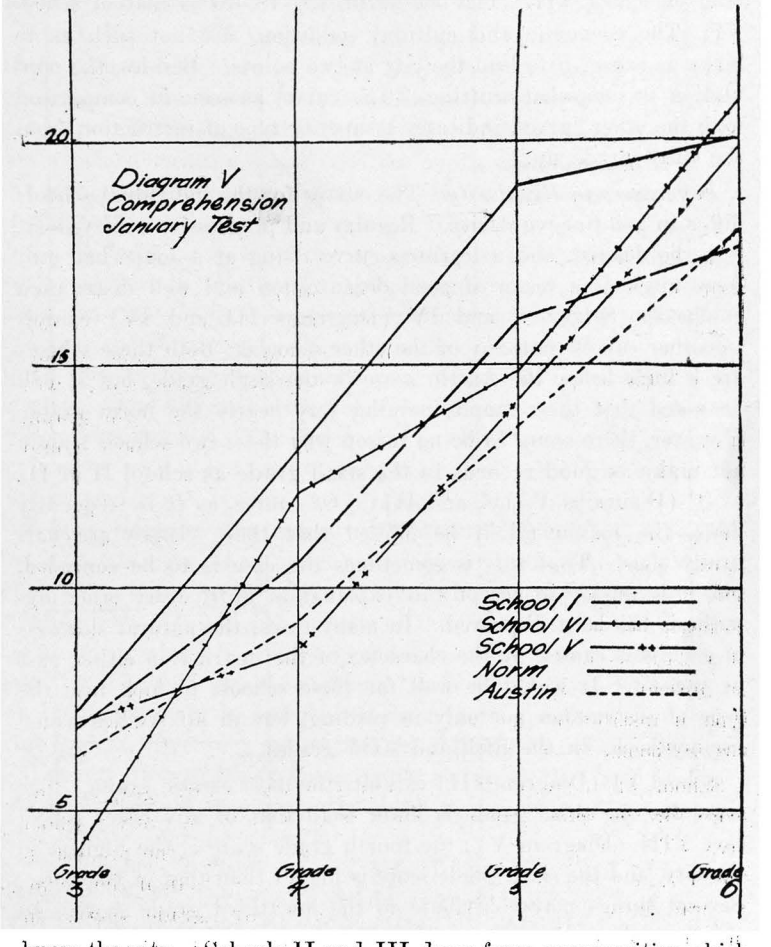


with the norm and the Austin curve. A comparison of these graphs will show that no school stands above the city's median in all grades. Two schools, I and VI (Diagram V) are above the median for the city in three grades; schools IV and V (Diagrams



IV and V) in two; schools II and III (Diagrams III and IV), in one; school IX (Diagram III) touches the median at one point; and schools VII and VIII (Diagrams IV and III) are entirely below it. Various conditions may affect a school's reading score besides the course of study and the character of instruction. Some of the most easily seen of these are the conditions under which instruction is given, economic and cultural conditions of the community, and the language spoken in the home. When all these are

taken into consideration, the general differences between the schools appear to be such as might be expected in all cases save one. Schools I, IV, and V, whose scores rank them among the best, are ranked first as to economic conditions and culture by those who



know the city. Schools II and III draw from communities which are ranked somewhat lower in point of economics. Moreover, they have a less homogenous patronage, with a greater percentage of children of foreign born parents. School IX is a small school whose teachers have more classes and a larger variety of classes

than those of most other schools of the city. Schools VII and VIII would be ranked lowest in the scale of economics and culture. School VIII is a small school with a hard-worked corps of teachers serving an outlying district formerly included in the district of school VII. The one surprising record is that of school VI. The economic and cultural conditions are not such as to make us expect it to lead the city at two points. Besides, the population is somewhat shifting. The curve, as seen in comparison with the other curves, indicates a superior type of instruction from the third grade up.

Differences in Regularity The curves for the individual schools differ in point of regularity. Regular and progressive achievement is to be desired, and a learning curve rising at a somewhat uniform angle is a token of good organization and well distributed emphasis. Schools I and IV (Diagrams III and IV) exhibit smoother curves than any of the other schools. Both these schools are a little below the Austin score in the sixth grade, but it will be noted that their graphs parallel very nearly the norm graph. However, there seems to be no reason why these two schools should not make as good records in the sixth grade as school II or III or V (Diagrams V, IV, and III). Of course, as it is frequently done, the reason might be offered that these classes are naturally slow. That this is sometimes the case is to be conceded, but it is unsafe to accept this explanation until every other hypothesis has been disproved. In many cases, the natural slowness of a class is caused by the character of the instruction either past or present. It would be well for these schools to look into the type of instruction not only in reading, but in all studies which use textbooks in the fifth and sixth grades.

School VI (Diagram III) exhibits the most erratic graph. The score for the third grade is lower than that of any other school save VIII (Diagram V); the fourth grade score is the highest in the city, and the sixth grade score is higher than that of the norm. Several things may contribute to the low third grade score. In the first place, there are twice as many low third, or 3A, pupils as 3B pupils in this grade. All of the other schools of the city, save school V, have more 3A's than 3B's in the third grade, but none of them has so large a proportion of 3A's as school VI. The shifting character of the population is accountable to some extent

for the low grade also. Such a population would throw into the third grade a number of children who had received their previous instruction in poor rural schools. Still, with the score as low as it is, it would be well for this school to examine carefully the character of instruction in the first and second grades.

School V presents a surprising drop in the fourth grade. Considering the community in which this school is located and the excellence of the scores for the other grades, this fourth grade score is not to be expected. One division of this grade, the division which contained a majority of the pupils who made low scores, has been under the same teacher for several terms, or semesters. She reports that it is a slow class. When the poor readers of this class were given the Gray oral tests, as will be described in a later section, it was found that their oral rate was considerably above the rate of other fourth grade children who had made low scores in the silent tests. That is, while in other schools it was found that the poor readers were poor because of slow word recognition, these children were poor merely because of a failure to comprehend quickly. The last word "quickly," was added because their silent rate is low, much lower than is warranted by the oral rate of the poorer readers in the grade. Corroboratory evidence that the children of this class are of the word-calling type of readers is the fact that the average oral score of those tested is somewhat lower than the average oral score of similarly placed pupils in schools II, III, and IV, in spite of the much better oral rate of the group in school V. With equal accuracy in reading orally, the score for school V would have been much better than the others, for the Gray score is conditioned upon both accuracy and rate. This evident inaccuracy means that the children do not pay a great deal of attention to the meaning of the matter as they read orally, for such attention would greatly lessen the number of omissions, substitutions, and insertions.

The graphs of schools II and III (Diagrams V and IV) are somewhat erratic, but show a steady upward movement beginning with the fourth grade. One explanation offered for the low scores in the lower grades of these two schools was that the tests were given by upper grade teachers whom the children of the primary department did not know and understand. It is reasonable to be-

lieve, also, that the disadvantage of having children of foreign extraction in school would appear greatest in the lower grades.

The drop in the sixth grade shown by the graph of school VII (Diagram IV) is hard to explain on any other theory than that the previous instruction of these pupils had been poor. The fourth grades of schools VIII and IX (Diagram V) are composed only of 4A children. This partially explains the low showing, particularly in school IX, whose curve is decidedly broken at the fourth.

Rate Scores. The rate scores of the individual schools may be studied in Table I. The differences between these scores with respect to both grades and schools correspond in general to the differences between the scores for comprehension. Notable exceptions are seen in the rate scores for the fifth grades of schools II and VII. These are much higher than the rate scores for the same grade of the other schools. The indication is that these pupils read more carelessly than any other fifth grade pupils in the city.

Need for Definite Standards in Primary Grades

Differences Among Third Grades An interesting study of the differences found among the third grades is found in a comparison of the different scores made by the third grades of five schools in which remedial work was attempted. In these schools oral tests were given to those pupils who made low scores in the silent test, in an effort to analyze their difficulties. Table III shows the median scores in comprehension for the third grades of these schools, together with the average oral rates and oral scores of the groups of poor readers.

TABLE III

Third Grade Scores of Five Schools

Schools	Grade Median in Comp.	Averages of Poor Readers.	
		Oral Rate	Oral Score
I	6.8	1.65	14.0
II	5.3	1.86	39.9
III	5.4	1.80	38.7
IV	6.0	2.36	47.1
V	6.9	1.71	28.5

From an examination of this table it is easy to see that the poor readers of schools I and V, which rank highest in comprehen-

sion, are poor because of inadequate word recognition. In a less degree this is true with schools II and III. With school IV this is not true. The standard oral score for the third grade is 46. Therefore the oral score and rate of the poor readers at that school seem to leave nothing to be desired so far as the mechanics of reading is concerned. It appears clearly that the differences in the comprehension scores of these five schools are not due to differences in teaching the mechanics of reading, but to differences in teaching reading from the comprehension standpoint. The differences in the third grade score, which are more evident when we notice the very low scores in comprehension of two of the other schools, argue for a unifying supervision. Even when we take into consideration the different conditions mentioned in an earlier passage, such great differences in ability to read manifested so early in the school career show that different governing purposes and different methods prevail among the primary teachers. A primary supervisor was employed for the first time this year, and it is to be hoped that similar tests given a year or two later will show scores more nearly alike.

Definite Standards These differences argue not only for a close supervision of primary methods, but for definite quantitative and qualitative standards for reading in the first and second grades. It should be required of first grade pupils that they read a certain number of pages of matter and make a certain score on a chosen standardized oral test before being promoted to the second grade. Corresponding definite requirements might be made for the second grade. In a similar recommendation to the Indianapolis schools, W. S. Gray (13) suggested as an illustration that each first grade pupil, "in order to be promoted, should read at least 600 pages and should be able to make a score of 30 when reading the Standardized Reading Paragraphs." Such definite standards will tend to level the differences this test has shown in third grade reading ability. They will be needed all the more in the next grade, for the greater number of supplementary texts furnished under the free textbook law will offer opportunity for considerable differences in the amount of matter read by the same grades in different schools.

Similar requirements should be made of the third, and perhaps of the fourth, grade. An examination of promotion records shows

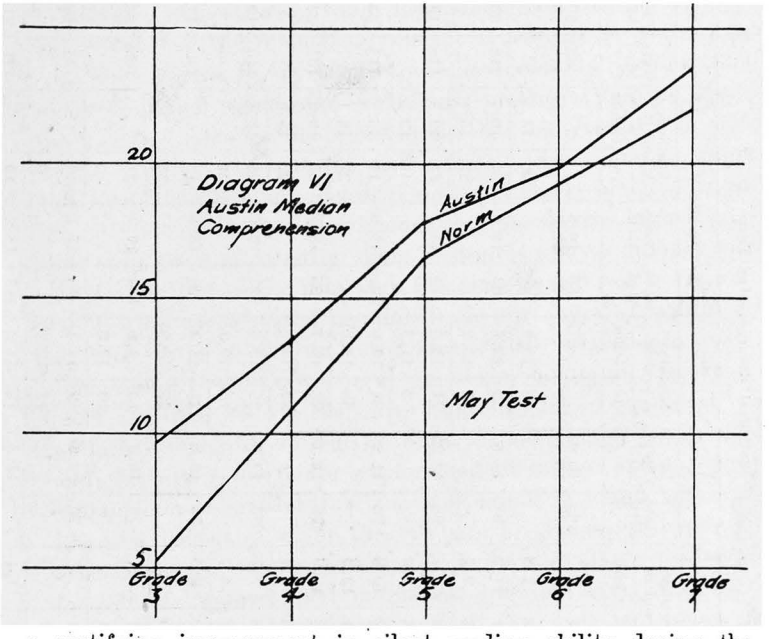
that during the past two years school IX, whose record in the test is the lowest in the city, promoted each term as large a percentage of pupils in reading as any other school in the city, and at the close of the first term of the present year it promoted a larger percentage than any other school.

Wider Reading Experience The outlook for a greater amount of reading both in and out of school is very promising. The comparatively large number of supplementary readers to be furnished by the State will give the teacher opportunity to choose plenty of reading matter adapted to the taste and ability of her class. Besides, a healthy interest in libraries has been shown by all the schools during the present year. It is to be hoped that, since there is no city library, each of the schools will soon have a working library suitable for primary and intermediate pupils. These libraries should contain not only books of a general nature, but books which bear upon the content subjects of the curriculum. Wide reading upon a subject of study gives a much stronger concrete grasp for the present, and a better background of meaning for future use, than intensive study of a few pages of text. A library of attractive books will give both the incentive and the opportunity for outside reading. In addition, special inducements may be offered to get children to read well chosen matter. These inducements might take the form of increased grades in reading, or other marks and distinctions; or the penalty of a reduced grade in reading might be imposed unless a certain minimum number of volumes were read. The great need of the intermediate grades is quantitative silent reading. It is through this, in great measure, that they will build up a background of meaning, and through this alone that they will develop the ability to comprehend the printed page. The wider this reading experience, the wider the range of reading ability will be.

A Later Test

During the last week of May, four months after the first test, another test was given to these same grades, using Form 2 of the Monroe test. Form 2 is of the same nature as Form 1, with entirely different material. The values are similar, but not exactly the same. The tests were given and scored in the same manner as the first, except that each elementary principal gave the tests in

his own school. Table IV shows the returns of the test arranged in the same order as Table II. A glance at the scores of the standard norm and the Austin norm shows that Austin is above the standard in every grade. Diagram VI presents graphs illustrating the respective positions of the two sets of scores. A glance at this diagram makes clear that the Austin showing is very creditable. A comparison of these curves with those illustrating the February scores (Diagram I) shows that the pupils of Austin made



a gratifying improvement in silent reading ability during the second term of school. Several things contributed to this improvement. These are seen in the following facts: (1) that they were given later in the year; (2) that this was the second test of a similar nature; (3) that the second term was not broken; and (4) that a great deal of interest had been aroused in the matter of silent reading.

A brief account of the presentation of the results of the test given in February to the teaching body will serve to make the last reason clear. After the data of the January tests had been tabulated, the graphs shown in Diagrams I and V were exhibited at

TABLE IV

Statistical Returns, May Test

	Grade III				Grade IV				Grade V				Grade VI				Grade VII	
	Rate Med.	Comp. Med.	Sections A and B		Rate Med.	Comp. Med.	Sections A and B		Rate Med.	Comp. Med.	Sections A and B		Rate Med.	Comp. Med.	Sections A and B		Rate Med.	Comp. Med.
			No.	Comp.			No.	Comp.			No.	Comp.			No.	Comp.		
Standard Scores	44	5.2	.....	.....	65	10.6	.....	.....	86	16.5	.....	.....	84	19.4	.....	.....	98	22.1
Austin Norm	61	9.6	.....	.....	76	13.4	.....	.....	103	17.7	.....	.....	115	19.8	.....	.....	133	23.6
			34	7.8			25	13.4			23	18.5			23			
School I	61	10.2	31	11.3	95	13.6	33	13.6	103	18.6	34	18.7	115	23.6	18	.....	.....	.....
			22	9.3			16	13.2			19	15.1			29	16.1		
School II	51	8.5	29	8.4	95	13.25	24	13.3	113	18.1	18	19.2	115	19.8	28	21.1	.....	.....
			23	11.3			8	11.3			19	13.6			15			
School III	76	11.3	17	10.8	76	11.9	24	13.6	92.5	13.65	11	13.7	115	23.6	18	.....	.....	.....
			21	12.3			38	13.6			27	18.1			32			
School IV	76	11.9	28	11.9	76	14.2	28	15.7	95	18.5	30	18.95	133	22.0	33			
			30	10.1			22	14.5			22	15.8			31			
School V	61	9.5	16	7.75	76	13.6	25	12.3	95	16.55	22	18.4	115	19.8	23	.....	.....	.....
			27	8.2			15	10.2			21				21			
School VI	61	8.6	12	9.5	76	10.8	27	11.3	99	15.8	15	.....	115	19.8	14	.....	.....	.....
			30				21	10.9			30				21			
School VII	61	8.6	31	.....	76	10.3	13	8.9	103	16.2	21	.....	103	16.5	27	.....	.....	.....
			11				10	11.3			0				14			
School VIII	61	7.8	14	.....	76	13.6	15	14.3	95	17.7	14	.....	95	16.35	14	.....	.....	.....
			7	7.9			11	12.0			0				14			
School IX	67	8.7	15	11.1	72.5	11.3	15	11.3	113	18.2	19	.....	141	21.1	13	.....	.....	.....

a principals' meeting with sufficient explanation to give them meaning. They aroused a great deal of interest. At the next teachers' institute this data was presented to the entire teaching body, with curves drawn on a blackboard to show the standing of every school with reference to the norm and the Austin median. On this occasion a number of teachers and principals offered explanations of the comparative positions of the curves for their grades or schools. The announcement was made that similar tests would be given at the close of the year, and a procedure for drills in silent reading was described at the request of some of the teachers. Another thing which added to the interest in silent reading, particularly in the schools concerned, was the remedial work which was organized in five of the schools. During the last term several of the teachers mentioned the increased emphasis they were giving to training in silent reading, and at the close of the term every principal, save one, told the investigators that his teachers had given considerably more attention to silent reading than ever in the past. A letter from one of the principals is quoted later.

While a comparison of Diagrams I and VI shows a great improvement, it is interesting to compare that improvement, in figures, with the January scores. It is not possible to compare the May scores with the January scores directly, because of a difference in difficulty of the two tests. The standard scores for the test used in January are greater than those for the test used in May, which fact shows that the May test is the most difficult of the two. Table V gives the two sets of standards with the difference in units between the standards for each grade. In the fourth line of the table these differences are expressed as percentages of the May standard scores.

TABLE V

Difference in Difficulty Between the Tests Used in January and May

Grade	III	IV	V	VI	VII
Norm, form 1	7.2	13.0	19.0	20.0	23.0
Norm, form 2	5.2	10.6	16.5	19.4	22.1
Increased difficulty of form 2	2.0	2.4	2.5	.6	.9
Per cent of increase	38.4%	22.6%	15.1%	3.0%	4.0%

If the scores made by the Austin pupils in May are to be compared with the scores they made in January, the scores for each

grade must be raised by the percentage of increase shown in Table V. This has been done in Table VI.

TABLE VI

Austin's May Scores in Comprehension Compared with January Scores

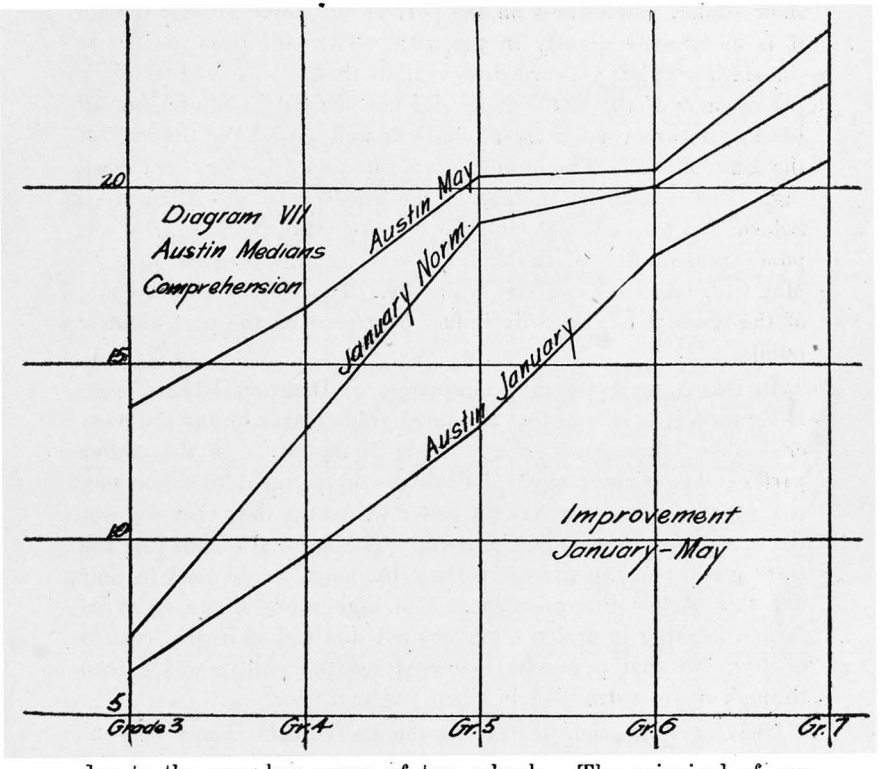
Grade	III	IV	V	VI	VII
Austin's scores, May	9.6	13.4	17.7	19.8	23.6
Increment of difference	3.6	3.0	2.6	.6	.9
May scores on January baris	13.2	16.4	20.3	20.4	24.5
Austin's scores, January	6.15	9.45	13.7	18.0	20.8
Gain in comp. units	7.05	6.95	6.6	2.4	3.7

Diagram VII shows graphs which illustrate this gain. This diagram contains curves for the Austin median in January, the norm for the test used in January, and the Austin median in May expressed in the comparable terms of Table VI. One of the first things to be noticed is the similarity of the comparative positions of the Austin May median and the norms in Diagrams VI and VII. The graph where the new scores are used shows the same general differences between city median and standard norm as the graph where the unchanged city median in May is compared with the norm for the May test. This similarity is, of course, what was to be expected when the Austin May scores were raised to the January basis.

These curves show a marked improvement. The most gratifying increase is that of the fourth and fifth grades. As pointed out in the interpretation of the January returns, the low position of these grades with reference to the norm curve was due chiefly to lack of training in silent reading. Their higher scores, which put them well above the norm and raised them practically as many units as the third grade, are due in large measure to the increased amount of training in silent reading they received. It is to be noted that the May curve for Austin is much more like the norm curve than is the January graph for Austin. This means that, with increased emphasis on silent reading in grades III, IV, and V, the children more quickly reach a comparative maximum of reading ability, with the mental advantage that such an ability adds.

The position of the sixth grade in the May curve for the city is a disappointment. The increase over the January score was, of course, not expected to be as great as that of the lower grades, but from the shape of the other portion of the curve the sixth

grade is out of place. It seems that the sixth grade should have shown at least as much improvement as the seventh. The fact that the sixth grade has reading classes while the seventh does not, and that silent reading was emphasized in more than half of these classes, at least, argue that the sixth grade improvement should be greater than that of the seventh. The low showing is



due to the very low scores of two schools. The principal of one of these schools expresses the opinion that the low score of his school is due to a considerable proportion of over-promotion, which has affected the work of that grade. This may be true of the other also. In addition, it must be remembered that the seventh grade pupils have more silent reading to do in preparation of their studies than the sixth. At this point it is interesting to compare Diagram VI, which shows the May graphs in comprehension, with Diagram VIII, which shows the May graphs in rate. Comparison

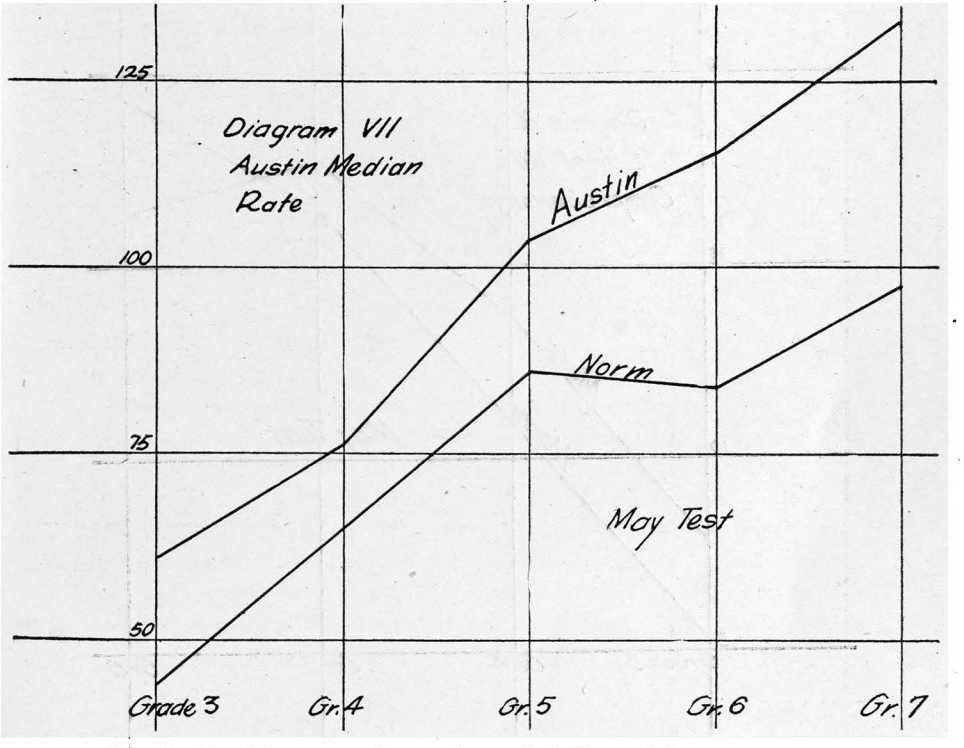
shows that the rates of the sixth and seventh grades were out of proportion to their comprehension. In other words, they read a great deal more carelessly than the children represented by the norm. This is, perhaps, due in both grades to an effort on the part of the pupils to read as much as possible and raise the record for their grades. Comparison of these same diagrams does not show similar carelessness on the part of the lower grades, though it is manifested slightly in the fifth. The indication, as far as the sixth grade is concerned, is that in their silent reading drills the teachers of the sixth grades did not succeed in impressing an ideal of accuracy upon their pupils as well as did the teachers of the lower grades. The seventh grades had no drills in silent reading. However, in the opinion of the principal of the Allan High School, the teachers were interested in the investigation after the public presentation of the January returns, and gave the tests in May with much interest and sympathy. This attitude on the part of the teachers might easily induce overspeed on the part of their pupils.

In taking up again the examination of Diagram VII, or even Diagram VI, it is seen that the third grade makes by far the most creditable improvement of any grade in the city. In the earlier part of this chapter slight indications were noted that the mechanics of reading were taught better in Austin than they were in the schools represented by the norm. The unusual distance of the third grade point in the curve above the norm would tend to bear out this earlier interpretation. The high score shows that the formal training in oral reading was not diminished in the least in quality, but that a greatly increased reading ability was gained through more instruction in silent reading.

The comprehension scores for the individual schools may be studied in Table IV. The results for school VIII deserve special notice. These results are shown in Diagram IX. This curve should be compared with the curve for the same school in Diagram V, which shows the relative position of the school in the January test. The improvement both absolutely and relatively is astonishing. In the January test, the school stood so low as to be in a class by itself. In the May test it stands in three grades with the schools which made the best showing, though the sixth grade is low. The

reason for this great improvement cannot be stated better than by quoting a portion of a letter from the principal:

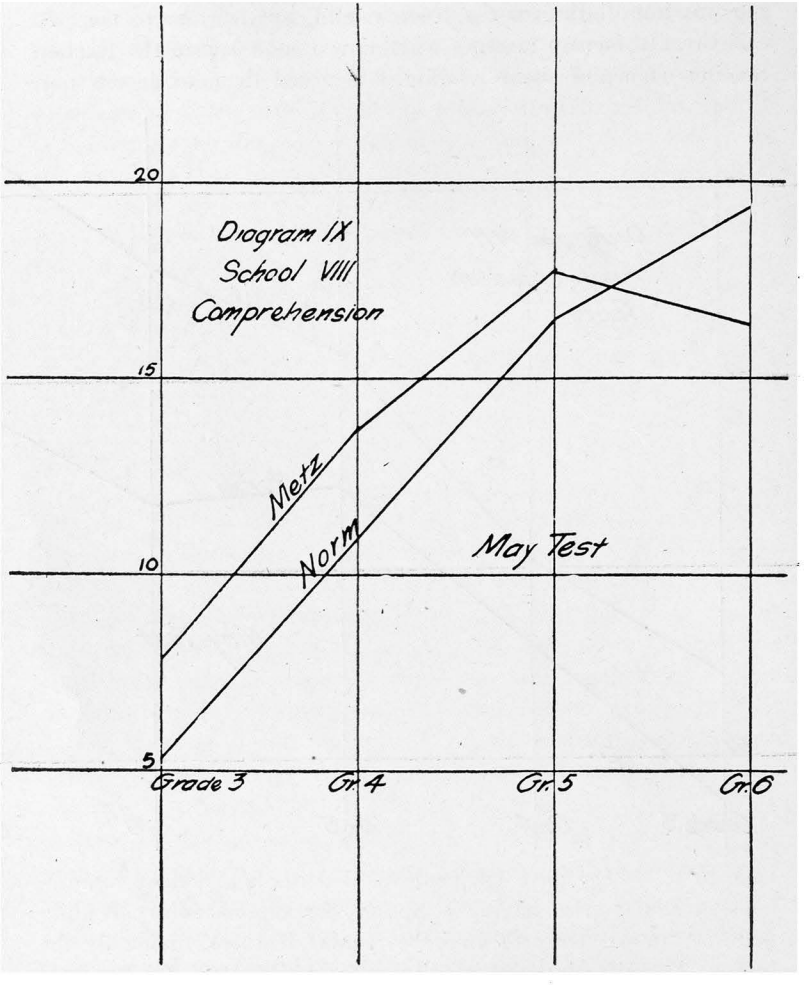
"* * * The very poor showing of our school in silent reading was humiliating to the teachers and especially so to me. At each weekly faculty meeting after that I kept before the teachers the importance of silent reading, and urged them to devote more



time to it. They gave frequent speed drills, and longer comprehension drills. Not having a library nor supplementary reading material for practice, we used the regular textbooks, not only the readers, but histories, physiologies, geographies, etc. The teachers of these special subjects would occasionally use the recitation period for intensive silent reading of a portion of the text. At such times they were always careful to test the comprehension of what was read. * * *"

This is an interesting letter. It illustrates the homely saying:

"Where there's a will, there's a way." No teacher need fail to give highly successful training in silent reading because she does not have interesting library books or fresh supplementary readers



that will delight the children. A point most worthy of comment is the aid in teaching reading given by the teachers of the con subjects. Good teachers recognize that every teacher must be responsible for teaching the elementary pupil to read. This is the foundation of his future success in school. While teaching him

the facts of a subject, she must train him to get those facts from the printed page. Every supervised study period is, during a good portion of the time, a silent reading drill in comprehension, and there are many occasions when it should be a drill in speed as well. When a pupil is trained to read the matter of a particular subject accurately and quickly, he has not only become a good student of that subject, but his reading ability in all subjects is increased.

CHAPTER III

THE LITERATURE OF INDIVIDUAL DIAGNOSIS AND REMEDY

As stated in the introduction, one phase of the general problem of this study was the diagnosis of the reading difficulties of individual pupils. It is the purpose of this chapter to give briefly the results which have been reported from various experiments upon the diagnosis of reading deficiencies and upon remedial work.

While tests of both oral and silent reading call attention to the faults of poor readers and, therefore, lend themselves to the diagnosis of reading difficulties of individual pupils, very few attempts at such diagnosis have been made. Practically all of the experiments in diagnosis and in remedial treatment thus far have been made in the training schools connected with departments of education. The diagnosis was made by specialists, and the corrective training was carried on by mature students of the psychology of reading or by teachers in the training school. It is clear that the conditions under which such investigations were carried out were different from the conditions under which this investigation was to be made, since it would be circumscribed by the limitations and demands of a public school system. However, it was recognized that the principles must be the same in each type of work. Accordingly, a study was made of the chief investigations and experiments which have been reported. The results of this study are given in this chapter.

DEFECTS IN READING REVEALED BY TESTS

Uhl's Investigation One of the first attempts at individual diagnosis was made by Uhl (14). This investigator made a diagnosis of the reading ability of a group of pupils in the Oshkosh Normal Training School. All pupils from the third to the eighth grades, inclusive, were given the Kelly silent reading tests. The next day the Gray oral reading scale was given to each of the same group of pupils. The following defects were noted: (1) extreme care; (2) carelessness; (3) mispronunciation of small words; (4) carrying over of the direction of one test into another; (5) reading word by word; (6) reading very loudly; and (7) repeating the first word of every sentence.

In addition to the analysis just noted, a record of certain other

points which came under the observation of the experimenter was made. These were as follows: (1) lack of intelligent interpretation; (2) hesitancy; and (3) gross bodily movements.

Zirbes' Investigation Another author who attacks this same problem is Zirbes (15). By using tests and observations, this author finds nine types of defects, listed as follows: (1) failure to phrase properly; (2) lack of proper motor habits for the eyes; (3) lack of ability to get meaning from a passage as a whole; (4) lack of ability to get a particular idea; (5) lack of ability to differentiate words; (6) errors in oral reading, such as omissions, repetitions, etc.; (7) lack of proper breath control; (8) lack of proper articulation; and (9) lack of voice control.

Another element which entered into the diagnosis made by Zirbes involved the division of the class into certain groups. This was done as follows: "A" readers were those whose rate was more than thirteen lines per minute; "B" readers were those whose rate was more than nine lines per minute but less than thirteen; "C" readers had a rate between six and nine times per minute; and those whose rate was less than six lines per minute were spoken of as "D" readers. Each of the defects mentioned above and each of these groups had special remedial measures applied.

Other Investigations Brown (1) has also attacked the problem of diagnosis. After reviewing a certain part of his data, he says:

"Pupil number one is deficient in the rate at which he can read; he gets a relatively large proportion of the context at his present rate of reading, but he reads so little in the unit of time that his efficiency is low." Further on he says: "Pupil number five has a difficulty which is easy to diagnose. In the first place, his rate of reading is not sufficiently rapid, but his quantity of reproduction is high. His mark for quality, on the other hand, falls to zero. In other words, he gets a good many ideas in the rough, but gets nothing accurately. What he gets is a mere smattering of the idea. His low mark for comprehension, together with his low rate of reading, gives him a low efficiency."

Courtis (3) has also touched upon the problem in these words:

"The child whose rate falls below the standard for his class is in need of special assistance. The causes of faulty reading are many, not one, and the remedy to be applied differs from individual to individual. Training in eye-movements, in ability to grasp

words, and in reaction time are among the types of training which might be used by the progressive teacher."

Judd (8) has emphasized the following difficulties in reading: (1) lack of ability to analyze words; (2) over care in reading; (3) rapid reading which neglects details; and (4) careless reading.

In addition to these investigations, Starch (12 has described in some detail one case in which the defect seemed to be slow assimilative power.

Gray (6) has prepared a diagnostic chart. This chart gives data upon seven different phases of reading ability, as follows: (1) oral reading achievement; (2) rate of oral reading; (3) number of errors per paragraph; (4) rate of silent reading; (5) number of questions interpreted in five minutes; (6) accuracy of interpretation; (7) ability to interpret material of increasing difficulty.

Finally, Monroe (10), in a chapter on "Correcting Defects in Reading," has summarized and discussed the various methods of diagnosis.

REMEDIAL MEASURES

Most of the authors who have just been quoted upon diagnosis have also proposed certain remedial measures. In this connection Uhl suggested the following remedial plans:

(1) The reading of very easy and interesting material; (2) the giving of particular attention to meaning; (3) the reading of short, easy sentences until read correctly; (4) "looking ahead" while reading; (5) a limited amount of drilling upon abstract material; and (6) encouragement of children to do outside reading.

Judd's Experiments Judd (8) emphasizes training in the analysis of words. Such training as this may be objected to on the ground that it would decrease the unit of perception instead of increasing it. Judd, however, justifies such training in the following words: "Training a child in the analysis of words may very properly be described as training him in the mechanics of reading. Purely mechanical training is, in an important sense, in opposition to the purpose of the school in its efforts to make good readers. The school aims to reach the level of fluent synthetic grasp of phrases. Mechanical training does, indeed, temporarily prevent from understanding the meaning of passages. Mechanical training would not be justified if distractions could be avoided by ready recognition

of all words. Mechanics are justified when they contribute to the final fluent recognition of words."

Further types of training suggested by this same author are training to reduce vocalization, to see phrases, to restrain movements of the eye, and training for proper interest in the subject matter. This writer also gives in some detail the results of certain types of training. Case G was given training in oral reading for six weeks. A second six weeks were given over to drill in phonics and to word analysis. In the third six weeks a great deal of silent reading was given. Each of the types of training was carried on at all times, but the various phases were stressed as indicated above. As a result of this training, the rate of oral reading increased from 2.4 words per second for the first six weeks to 2.7 words per second for the last six weeks, while the errors decreased from 4.5 per hundred words read to 1.1 per hundred words. In teaching word analysis various systems of phonics with variations were used. In teaching silent reading, paragraphs or selections dealing with topics which were of special interest to the child were used. In some cases the selections were modified so that they contained words learned in the exercises in phonics. In other cases questions were proposed, the answers to which were to be found in the material to be read. As a result of this training, the rate of silent reading increased from 2.4 to 3.6 words per second, and comprehension increased from 22 per cent to 74 per cent.

In addition to these results certain other effects of the training are recorded, as follows:

"Her teachers report that case G reads with much greater ease and fluency of expression, the quality of her voice has improved and the nasal tones have almost disappeared. She seems to enjoy reading silently much more than before training. Frequently she expresses a preference for reading a passage silently, saying, 'I can do it faster.' Her oral reproductions contain many more of the expressions found in the original passage than formerly."

Case H was given much oral reading and phonic analysis, with a few minutes of silent reading for the first six weeks. This training resulted in increasing the rate of oral reading from 1.33 words per second to 2.57 words per second, and the number of errors in

the same passage before and after practice was reduced from 47 to 15.

During a second period of six weeks silent reading was emphasized. In this training narrative material was used at first, and later informational material was introduced. The factor of personal interest was also used to advantage. After such reading, either oral or written reproduction was required.

In the report upon another pupil an intensive study of words is suggested. The term, "an indomitable hero," was introduced in a selection read by the child. This led to the following synonyms and equivalent phrases:

indomitable	heroic	intrepid
courageous	bold	audacious
resolute	daring	defiant
manly	plucky	undismayed
fearless	stout hearted	

to look danger in the face
to screw one's courage to the sticking point
to take the bull by the horns
to beard the lion in his den
to put on a bold front

Gray's Experiments Gray (5) has also devised training with reference to special difficulties in reading. The pupils used as subjects in each case were selected because earlier study of their reading processes had shown their individual needs. The practice was carried on in each case for twenty days, twenty minutes each day, under the direction of a college student.

The first type of training may be designated as training for speed. The subject here was a fifth grade girl. The directions given to the child were that she was to read fast, even if comprehension should be sacrificed. The results of this work showed a very decided increase in speed and in some parts of the work a considerable gain in comprehension.

The second type of training was given in short exposure work. The object of this work was to determine whether the span of attention could be increased by training. The importance of the span of attention in its relation to reading has been emphasized; and, if the range of attention can be increased by training, it

seems plausible that the effect of such practice could easily be carried over into the reading activity.

Two different experiments were performed. In the first, two boys from the sixth grade were the subjects. This training failed to produce results. The second experiment was performed with two pupils in the fourth grade. In this case there was a distinct improvement. Such results show that practice in perception is effective if given early, and that certain habits in connection with the reading process seem to be established earlier in the life of the child than has been supposed.

In passing, it should be noted that this type of work is closely related to the flash-card-work done in the early grades and gives such work a new importance. It seems highly probable that work of this kind should be much better controlled and given more emphasis in the early training done in reading.

The next type of training had to do with the decrease of vocalization in silent reading. The subjects in this case were pupils whose silent reading might be characterized as "inaudible oral" reading. At the beginning of the practice some explanation of the effects of a large degree of vocalization was made. The subjects were directed to read in their normal way except that they were to eliminate the vocalization. After a few days the movements disappeared almost entirely, and the instructor reported great progress and was very enthusiastic about the results. When the work was checked it was found that there had been a very considerable increase made in rate, but that there was a decrease in comprehension. This decrease in comprehension may have been due to the fact that these were children whose mental activity demanded motor accompaniment, or it may have been due to the fact that the decrease in vocalization was brought about too rapidly.

Another type of training had to do with comprehension. The work here consisted in reading selections carefully with a view to emphasizing those elements on which the meaning depended. Such matters as topic sentences, relational words, and the effects of different types of modifying phrases were discussed. The results may be summarized briefly, thus: (1) there was a distinct increase in rate; (2) the first subject made a slight gain in comprehension, while the second one failed to make any gain in this phase of the work. The results for the second subject were explained by the

instructor as being due to this pupil's attitude toward the work, which was entirely adverse. These results do not seem very encouraging, and yet it is true that where gains in comprehension were made they are greater than those shown in any other type of training. It is probably true that this phase of reading requires a longer period of practice in which to produce changes than does any one of the other phases so far tested.

The last type of training to be considered had to do with phonics. Two third grade boys who showed a lack of ability to deal with new words were trained in this work. The practice was not connected up in any way with their reading work; and, although there was a very appreciable increase in their ability to analyze and pronounce new words, the effect did not show itself in their reading. This makes clear the desirability of correlating any type of training with the reading activities of the pupil.

The results of these experiments may be summarized as follows:

1. It is quite clear that speed, comprehension, and vocalization can be changed and modified in a positive direction by practice. It is true also that the perceptual span can be increased if the training is given early in the child's school life.

2. It is evident that there is need of a careful technique for the different types of practice, and that especially trained instructors are a necessity if such training is to be carried very far.

3. It is an open question as to just how far certain types of training should be carried, as shown by the falling off in comprehension in many cases.

4. Rate lends itself to improvement by different methods. Such an increase can be brought about by training in rapid reading, by training in decreasing vocalization, by training in phonics, and by training in comprehension. In three of these methods speed in reading was not emphasized, and yet in each case there is a marked increase in rate. In other words, it seems that if the attention of the reader is directed to any one of these four phases of the reading process the result is an increase in rate.

Experiments in a Schoolroom An objection to the preceding methods may be raised because they do not seem practical, since they have been based upon individual instruction and have been conducted by a special teacher outside the regular reading period. Such objections are probably valid, but such methods have value

because they show that the poor reader's efficiency can be increased by certain types of training, and they give some idea concerning the amount of training required to get certain results.

That special training in reading can be conducted in a schoolroom by the regular teacher as a part of the daily work has been shown by Miss Zirbes (15). She has given special training to a class for a period of seven months. This training was of such a nature as to meet the particular needs of the various pupils and was conducted during the regular reading period. The work was divided into ten different types of lessons. These are elaborated by this author as follows:

"Type Lesson 1 All look at the first phrase, looking up when they reach a comma, or a period. When the entire group is looking at the teacher she nods and they repeat the phrase. She watches individuals to find their difficulties, but does not interrupt. When they have said all but the last word of the phrase they again look down, silently getting the next phrase and looking up, holding the phrase in mind until all are ready. Again the teacher nods and the group gives the phrase orally, looking down at the last word and continuing this procedure to the end of the paragraph or section. The intensive study calculated to improve poor readers can be made to yield a double analytic study, the unit is the phrase or group of words which expresses an idea. Instead of working at a difficult word, the phrase in which it appears is mastered. Instead of working with a child at a time and giving each child only a few minutes of actual oral reading, four or five of those who have similar ability are grouped together, while other groups of poor readers follow silently. Third grade material or very simple fourth grade material is used for this purpose.

"While oral reproduction and discussion is then employed to measure the quality of silent reading done by pupils who have been working at type 3 lesson, the ones who have had type 1 answer mentally or in writing, blackboard questions concerning the material of their lesson. Occasionally duplicated sheets containing uncompleted sentences or a story are used instead, the children filling in the blanks mentally or in writing.

"Type Lesson 2 Eye-training and Focus Field of vision enlarged to include several words rather than one. First, by having the book far enough from the eyes. Second, by eliminating the

use of a finger or other place-keeping devices. Third, by work with flash cards, flashing phrases, trying to get a phrase with one flash (orally), counting the number of flashes needed for each phrase. These phrases can be cut from current printed matter and mounted on small cards. Written sentences directing children to perform certain activities are also to be used as flash material. The one who first reads the direction carries it out. The pupil who had three such opportunities in succession was given a sheet with similar work in silent reading. This finished he returned to the group.

"Type Lesson 3 Silent reading for the purpose of oral reproduction and comprehension.

"Type Lesson 4 Silent reading in search of a given phrase, answer, idea, or suggestion in the content of supplementary books, geography text, arithmetic text, and blackboard work.

"Type Lesson 5 Differentiation for pupils who confuse similar words or miscall syllables, guess at words, or omit endings. Lists like the following form the basis of such work. Lists are compiled from actual mistakes made by children.

that	woman	beautifully	swimming
when	every	prettiest	board
what	never	prettily	close
then	even	probably	chose
how	ever	lovingly	lying
who	very	companions	buying
then	these	understand	tired
there	those	understood	tried
than	now	laughingly	certain
women	know	quietly	curtain
man	beautiful		

"Type Lesson 6 Lessons in accuracy for those who make errors, substitutions, and omissions, reading a page and counting errors, or reading until they make an error to see how many lines they can read perfectly.

"Type Lesson 7 Breathing exercises. Children are taught to breathe rhythmically at ends of phrases or clauses instead of breaking the smoothness of reading. Practice in breath control is thus related to the problem of meaning and interpretation. Abdominal breathing is taught.

"Type Lesson 8 Articulation exercises for mumblers, or those with other bad speech habits.

"Type Lesson 9 Voice work and expression. Unpleasant voice quality and monotony corrected by special practice and training. Children are taught to vary meaning by change of stress and to show relative importance of ideas similarly. Punctuation is studied for the same purpose."

Any pupil who was found deficient in any of these phases of reading was expected to take training in that particular phase until satisfactory proficiency was attained. This means that the number of lessons in any one aspect of the training was a variable quantity depending upon the individual pupil. In addition to this, a great deal of reading was done.

The charts and graphs showing the progress made by the different pupils cannot be presented here, but it is sufficient to say that the result seems highly satisfactory. In a personal conference Miss Zirbes maintained that such a procedure rationalized the whole reading process for the children, that they saw the reason for everything they were required to do, and that for this reason their work was even more satisfactory.

CHAPTER IV

INDIVIDUAL DIAGNOSIS AND REMEDIAL MEASURES PRESCRIBED

Five centrally located schools were chosen for the diagnosis of the difficulties of their poor readers and for the administration of remedial training. These were schools I, II, III, IV, and V. One disadvantage, apparent at the outset, was that the investigators had no official connection with any of these schools, except in the case of the one school of which Mr. Lloyd was principal. They were forced to depend entirely upon the friendly interest of the principals and teachers of the other schools. This interest, however, was good, and it was strengthened by the encouragement of the superintendent. Another clear disadvantage was that, with the demands of their own work upon them, the investigators would have no chance to supervise the work after it was put in the hands of the teachers. However, it was felt that these disadvantages would make the experiment all the more valuable if it succeeded, for it would show what might be done in almost any system. The discussion which follows will show the plan of selecting the poor readers, the method of diagnosis, the training prescribed, and the types of instruction given the teachers for carrying on the remedial work. The results of the training, as shown by a later test, will be given in another chapter.

The Method of Diagnosis

Interpretation of the Silent Test Scores From the test papers of each third, fourth, and fifth grade of the schools mentioned above, three groups of papers were chosen for further study. These were those papers which were noticeably below the median in comprehension for the grade in that school, those which were unusually high, and those whose comprehension score was low in comparison with the rate score. The first group usually comprised about one-third of the class. The next two groups contained very few pupils, sometimes none. A sheet, hereafter to be known as a class sheet, was then prepared, containing the names of pupils listed in the order of their scores in comprehension. The data noted for each name were age, grade section, and scores in rate and comprehension. To the right of this data was left a blank space for the

investigator's interpretation. On the first line of this grade sheet the median scores for that grade in rate and comprehension were placed. The scores of the individual pupils listed were to be compared with these medians, and the pupil's condition and ability as a reader interpreted from such comparison.

In the effort to make this interpretation it was found necessary to examine the papers themselves. This seemed advisable because the prescribed method of answering in some cases gave a pupil no credit for his answer, although the internal evidence showed that he comprehended the matter thoroughly. Some of the exercises, for instance, are to be handled by underscoring a certain word, while all other methods of indicating the answer are to be marked incorrect. The pupil who draws a circle around a word instead of underscoring it is, of course, not as careful in following directions as he might be, but he shows no lack of ability in comprehending the meaning of the passage. To be marked down for his failure in following a minute direction is contrary to the pupil's school experience, for usually he is commended when he arrives at the heart of the matter, even if he does not express it according to the prescribed formula. Experience in this effort to estimate the individual pupil's ability showed that, where the tests are used for purposes of analysis rather than as a basis for comparison of school systems, it would be more expeditious to mark as correct any answer which gave evidence that the pupil understood the passage. In this connection it may be stated that the use of a mark for index of comprehension would facilitate the work of individual analysis. Such a mark, showing the proportion of correct answers to the number attempted, or the proportion of the value of those answered to the value of all attempted, together with the more liberal scoring for comprehension suggested, would enable the investigator, by a mere glance at the scores on a paper, to make an interpretation.

In interpreting the pupil's condition and probable needs, the chart of interpretation, Chart I, was used. This chart is an accurate description of the scheme actually used. It developed through practice and was put in its present form after procedure had crystallized into such a course. Acknowledgment must be made here, however, of suggestions received, both as to the method of work and the form of the chart, from the somewhat similar

chart published by Courtis. The descriptive terms used are to be understood only with reference to the class median, with which each score was compared, except in those cases where rate and comprehension are compared with each other. The scores for each pupil in both rate and comprehension were compared with the grade medians at the head of the class sheet, and the findings in accordance with the chart of interpretation were written down in the blank space to the right of the name. It is understood, of course, that the scores in comprehension were modified at times in the minds of the investigators by the internal evidence as described in a preceding paragraph. In such cases interpretation was based upon what the score should have been, and not as actually written.

CHART I

Chart of Interpretation Used With the Monroe Silent Reading Test

	Rate Score	Comp. Score	
1	Very high.....	Very high.....	Unusual ability. Should probably be promoted.
2	High.....	Low in comparison with rate.	Careless reader.
3	About class median.	Low.....	Poor comprehension.
4	Mod. low.....	About class median.	Careful reader, somewhat slow.
5	Low.....	Nearly perfect score.	Slow reader.
6	Low.....	Imperfect score...	Poor reading ability. Training in word recognition and comprehension.
7	Very low.....	Very low.....	Probably vary poor native ability. Perhaps demotion.

Diagnosis by Oral Tests To all the readers listed on the class sheets, save those whose scores in rate and comprehension were very high, the Gray oral tests were given. The single score with which the oral sheet is marked was found to be not sufficiently discriminating for purposes of diagnosis. This had to be supplemented by the rate in words per second and by an estimation of the pupil's accuracy. In fact, rate and accuracy were found to be the most important data. The score does not show whether the errors were due to ignorance of the words or inaccuracies in the nature of insertions, substitutions, or omissions. Besides, it was found possible for a poor reader whose familiarity with words was

not sufficient for him to recognize them speedily enough to read for meaning, to make a score greater than the published standard because of his extreme care in calling the words. The accuracy was indicated upon the face of the sheet by the number of substitutions, insertions, and omissions. The difficulty in determining the rate of an individual pupil was in deciding upon what paragraph should be used for his grade. There was not time to make accurate investigation; but, in order that the work might proceed, a tentative choice was made of paragraphs 4, 5, and 6 for grades III, IV, and V, respectively. These were chosen because in a number of cases it was noted that fair or good oral readers among those being tested showed a tendency to slow down, or drop, in score after these paragraphs were passed. The appropriate paragraph was used to determine the rate of a pupil unless his for the paragraphs immediately preceding or succeeding this showed it to be unreliable.

Charts II, III, and IV show the results of an investigation to determine whether this tentative choice of significant paragraphs was correct. In the middle of the second term, oral tests were given to thirty-six pupils chosen by their teachers as good readers from grades III, IV, and V of schools I, III, and V. Two pupils were chosen from each section of these grades in each of the schools. Teachers were asked to furnish readers they considered good, or thoroughly satisfactory, but not the unusually fine readers. These charts give the number of paragraphs, and under each initial are recorded the number of seconds consumed in reading each paragraph and the score made upon it. The approximate number of words in each of the first six paragraphs is given. The other paragraphs contain as many lines as paragraphs 4, 5, and 6, but fewer words. The irregular line drawn across the page marks the point at which there was a decided slowing down in rate or drop in score. An examination will reveal that in the third grade this line comes above the fourth paragraph in three cases. In most of the others it runs between the fourth and fifth. Since these were good readers, the diagram shows that the selection of the fourth paragraph was a little severe, especially for the 3A pupils. The third would have been a more conservative choice. The choice of the fifth pargaraph as the criterion for the fourth grade pupils seems amply justified by the diagram. The line of division lies

below the fifth paragraph in every case save one. This one case is probably that of a poor reader included in the list of fair or good readers because his reading lessons are well prepared. Through such careful and commendable preparation he keeps his teacher from finding out his weakness. The line across the chart for the fifth grade shows that the sixth paragraph is an easy test, but perhaps rigid enough. Only one of these readers showed a perceptible retardation before the eighth.

CHART II

Paragraph for Rate Measure of Third Grade

No. Paragraph	Approximate Number Words	Number seconds required for paragraphs by each pupil.												
			3-A Pupils					3-B Pupils						
		P S	S M	E S	S R	F M	V E	J M	S R	R F	K L	J C	E W
1	50	25 4	21 4	20 4	20 4	20 4	15 4	15 4	20 4	20 4	20 4	15 3	12 4
2	50	20 2	20 4	21 4	20 4	20 4	25 4	15 4	15 3	20 4	20 4	20 4	15 4
3	50	25 2	20 4	30 4	20 4	20 4	20 4	16 4	20 3	20 4	20 4	20 4	12 4
4	60	35 3	25 4	25 4	30 4	40 4	25 3	20 4	20 1	30 3	20 4	25 4	15 4
5	60	75 0	35 1	40 3	23 4	70 0	60 1	25 4	30 2	30 4	25 4	30 4	20 3
6	60	....	45 1	40 0	35 3	....	40 3	30 2	30 1	40 3	25 1	45 4	17 4
7	.....	....	70 0	....	40 0	....	75 0	40 0	35 2	62 0	25 0	40 0	25 2
8	.....	....	....	....	....	....	....	40 2	55 0	....	....	45 1	20 3

The data from the oral test in most cases enabled the investigators to make a diagnosis of the cause of the reader's condition as shown by the silent test, and offered a basis for the prescription of remedial treatment. In handling the first class sheets an attempt was made to diagnose and prescribe on the basis of the data from the silent test alone; but in many instances the judgment of the investigators was shown to be wrong by the returns of the oral test, except in cases six and seven of the chart of interpretation. Taking up the cases according to the number given in the chart of interpretation (Chart I) the different diagnoses which may be made are shown as follows:

Case 1 The oral test was usually not given; but in those cases

CHART III

Paragraph for Rate Measure of Fourth Grade

No. Paragraph	Approximate Number Words	Number seconds required for paragraphs by each pupil																	
		4-A Pupils										4-B Pupils							
		K	L	W	E	F	M	D	C	T	M	S	C	M	F	M	H	S	M	B	G	K	P	Q	P
1	50	10	4	....	....	30	2	20	4	11	4	15	4	....	....	....	....	....	....	....	....	4		4	
2	50	12	4	....	....	25	4	15	4	15	4	10	4	....	....	....	....	....	....	....	....	4		4	
3	50	15	4	....	....	30	2	20	4	20	4	15	4	....	....	....	....	....	....	....	....	20	4	15	4
4	60	20	3	20	4	40	1	25	4	23	3	15	4	20	4	15	4	15	4	15	4	25	2	15	4
5	60	21	4	22	4	70	0	25	4	23	4	20	4	25	3	25	4	25	4	20	4	30	2	20	4
6	60	17	4	25	4	....	....	30	4	30	2	20	4	20	4	25	3	20	4	30	1	35	1	15	4
7		20	2	20	4	....	....	30	3	35	1	20	4	30	2	25	3	25	3	30	1	30	2	25	4
8		25	3	25	4	....	....	30	3	45	1	20	4	35	3	30	4	25	3	30	1	35	0	25	4
9		25	1	23	3	....	....	40	3	35	1	30	4	40	2	25	0	30	2	40	0	....	....	30	4

CHART IV

Paragraph for Rate Measure of Fifth Grade

No. Paragraph	Approximate Number Words	Number seconds required for paragraphs by each pupil																	
		5-A Pupils										5-B Pupils							
		M	D	D	M	B	F	J	D	H	M	S	M	L	V	G	D	G	D	W	M	A	C	R	B
4	60	16	4	15	4	20	4	20	4	15	4	20	4	20	3	15	4	15	4	15	4	30	4	15	4
5	60	17	4	15	4	20	4	25	4	15	4	20	4	20	4	20	4	20	4	30	4	25	4	30	4
6	60	20	4	20	4	17	4	15	4	20	4	25	4	20	4	20	4	20	4	30	4	25	2	20	4
7		15	4	25	2	20	4	20	4	15	4	25	4	20	4	20	4	20	4	35	4	20	1	20	4
8		30	4	20	2	33	2	20	4	30	3	20	4	25	4	23	4	30	4	40	3	30	1	30	2
9		40	2	20	3	40	0	20	3	30	3	25	2	35	3	25	2	25	3	50	3	25	2	20	3
10		30	3	30	2	....	....	35	3	30	3	20	3	40	2	30	1	25	2	50	3	25	0	30	3
11		35	1	25	1	....	....	40	3	40	0	25	1	45	1	20	2	30	1	90	0	....	....	35	0
12		35	1	....	0	....	....	....	....	35	1	....	....	40	0	40	0	40	0	40	0	....	....	....	....

where it was given it showed, as was to be expected, that the oral rate is always high.

Case 2 A high oral rate shows that the pupil is a word caller and needs training in comprehension. A low oral rate shows that the pupil hurried over in silence a great deal that he was really unable to read. Training in word recognition is shown to be the first need. Frequently the oral sheet shows a great deal of inaccuracy, which calls for training to counteract it. In the more prominent instances of case 2 a marked lack of intelligence is suspected.

Case 3 A fair or high oral rate here shows that the trouble is merely in interpretation, and training in comprehension is needed. A low oral rate shows that so much of the energy goes into word recognition that there is little left for comprehension. Training in word recognition, then, is the first thing necessary.

Case 4 If the oral rate is fair or high, training in rapid silent reading is called for. Frequently the oral rate is low, and this indicates the need of training in word recognition to increase the speed.

Case 5 As case 4 above; the two cases are really one, with a difference in degree. In the class sheets made toward the last, no distinction was made between them, but the pupil was merely designated as a slow, careful reader.

Case 6 The majority of such cases show low oral rate and score, calling for a fundamental training in word recognition. If the oral rate is fair, very weak interpretation is indicated, with the most elemental training in meanings needed.

Case 7 This case always shows a low oral rate and oral score.

In the cases just described the function of the oral score was not shown, and yet it aided in the diagnosis in conjunction with the rate. Usually rate and score were in proportion to each other; but when they were not in proportion, an explanation was sought by an examination of the oral sheet. A low score with a fair oral rate might mean merely oral inaccuracy; or it might mean that the pupil reads rapidly, calling correctly the words that he knows, but passing over with the barest attempt at pronunciation the words he is ignorant of. The first case above would need chiefly training in the careful inspection of words, while the second case would need training in word structure. A high score with a low

oral rate would indicate great oral accuracy, but need of such a training in word structure as would give quick recognition and an increased reading vocabulary. In practice, no diagnosis was made without careful examination of the oral sheet. An oral rate below 2 words per second was usually considered low; a rate above 2.3 words per second, fair; and a rate over 3 words per second, high.

In order that the diagnosis may be understood more fully by the reader, a diagnostic chart, Chart V, is presented. This chart gives in less detail the description that has preceded, showing both the diagnosis of the difficulty and the general character of the remedial work that such a diagnosis suggests.

CHART V

Diagnostic Chart Used With the Monroe Silent Reading Test and the Gray Oral Reading Test

Silent Rate	Comprehension	Oral Rate	
1 Very high...	Very high...	High (always)	Unusual ability. Should probably be promoted.
2 High.....	Low in comparison with rate.	High.....	Careless reader. Training in accuracy.
3 High.....	Low in comparison with rate.	Low.....	Hurried in silent test over a great deal he was really unable to read. Training in word recognition first. Also in accuracy.
4 Mod. low....	About class median.	Fair or high.	Careful reader, somewhat slow Perhaps a training in silent speed.
5 Mod. low....	About class median.	Low.....	Careful but slow reader due to faulty word recognition. Training in word recognition.
6 About class median.	Low.....	Fair or high..	Poor comprehension. Training in comprehension.
7 About class median.	Low.....	Low.....	Poor comprehension, as energy goes into word recognition. Training in word recognition.
8 Low.....	Nearly perfect score.	Fair or high..	Slow silent reader. Training in silent speed and quick interpretation.
9 Low.....	Nearly perfect score.	Low.....	Slow reader. Training in word recognition.
10 Low.....	Imperfect score.	Fair or high (rare)	Poor comprehension. Careful training in comprehension.
11 Low.....	Imperfect score.	Low.....	Poor reading ability. Fundamental training in word recognition.
12 Very low....	Very low....	Low (always)	Poor reading ability. Usually poor native ability. Fundamental training in word recognition, or ungraded room, or demotion.

CHART VI

Classes of Readers

Silent Rate	Comprehension	Oral Rate	
1 Very high...	High index..	.....	Readers of unusual ability. Should probably be promoted.
2 High or median.	High index..	.....	Satisfactory readers.
3 Median, high, or low.	Low index...	Fair or high..	Poor in comprehension. Training in accuracy of interpretation needed.
4 Median, high, or low.	Low index...	Low.....	Poor in comprehension because of poor word mastery. Training in word recognition needed.
5 Below median.	High index..	Fair or high..	Slow reader. Slow rate due to slow eye habits, or slow assimilative power, or over-carefulness. Training in silent speed and quick interpretation needed.
6 Below median.	High index..	Low.....	Slow reader. Slow rate due to poor word mastery. Training in word recognition needed.

The similarity of diagnosis and remedial treatment indicated in several cases of the diagnostic chart suggests that the types of readers shown by the tests may be grouped into a few classes. This has been done in Chart VI, which is labeled "Classes of Readers" to distinguish it from the fuller diagnostic chart actually used in the work of diagnosis and prescription. To this chart has been added that class of readers whose scores cluster about or are above the median--readers who do not show on the other charts, and to whom in this investigation no oral tests were given. This class is numbered two, and is, of course, the most numerous of all. Together with class one, it includes all the readers whose ability as shown by the tests is satisfactory. The last four classes comprise those for whom remedial treatment was attempted. In this chart the term *index of comprehension* is used to indicate the comparison between the score in comprehension and the score in rate, or the proportion which the number of answers that were correct bears to the number attempted.

Tests for Perceptual Span In addition to the silent and oral tests, a test for perceptual span was given to the selected readers of the two schools whose class sheets were prepared first. This was done by means of a stereopticon lantern fitted with a photographic shutter which was timed for an exposure of one-fifth of

a second. The test was conducted in a partially darkened room. The pupils were grouped in easy seeing distance before a white canvas, upon which were flashed in order sixteen phrases and sentences made up of words which any third grade pupil should know. The general character of the phrases may be seen in the samples which follow:

Pick flowers.
One of my chicks is lost.
The man can run fast.
Swim and play.
They bow to the wind.
The ark is ready.
They keep step as they march.

After each exposure the children were given sufficient time to write on a sheet of paper the words they saw. These sheets were examined for the (a) percentage of words read correctly; (b) the number of lines missed entirely; and (c) the greatest number of words read in a line. Table VII shows these data for the pupils of the fourth and fifth grades of one school. The names have been arranged in the order of their oral rate. An examination of this table shows in each grade a tendency toward improvement with increased oral rate both in percentage of words read correctly and the greatest number of words read at an exposure. However, there are notable differences that do not tally with the rate or oral score—that is, differences which cannot be explained by different degrees of familiarity with language forms. These, as pointed out by Gray (12), may be due to differences in the organization of the nervous system, in the level of attention at which the subjects worked, or in the kind of training they had received in reading. The only training which has ever been used successfully to increase span of attention, other than ordinary practice in reading silently, is the short exposure method. As was shown in an earlier section this succeded in Gray's experiment with third and fourth grade children. The only change in remedial measures then effected by the test for the span of perception would be the use or omission of flash card practice. After consideration, the investigators decided to prescribe flash card practice for all pupils whose oral reading was shown to be poor. This decision, which rendered unnecessary the continuation of the investigation of perception, was

made because the time which could be given to the work of diagnosis was limited.

TABLE VII

Span of Perception

Pupils	Rate	Score	Per Cent Words Read	Exposures Missed	Greatest Number Words Read
GRADE IV					
W. V.	1.3	14	16	10	2
W. J.	1.4	37	23	3	3
L. J.	1.6	42	33	4	3
R. C.	2.0	40	41	2	3
W. A.	2.1	31	48	2	4
N. M.	2.4	37	10	11	1
G. P.	2.5	67	51	1	4
C. I.	2.7	49	25	8	4
L. B.	2.7	55	42	2	4
Y. F.	3.0	49	28	8	3
P. C.	3.0	64	54	4	5
GRADE V					
M. E.	1.7	39	22	7	2
B. W.	1.8	11	34	0	3
G. M.	1.9	39	44	0	4
C. E.	2.0	12	33	1	2
A. M.	2.0	50	39	2	4
M. J.	2.0	51	28	3	3
S. A.	2.2	50	39	3	4
S. H.	2.3	51	48	0	4
J. P.	2.4	32	48	1	4
H. J.	2.5	47	16	8	2
W. E.	2.7	60	48	0	3
R. M.	3.0	45	47	0	4
D. E.	3.0	63	43	3	4

Tests of Eye-movements Tests were made of the eye-movements of the poor readers at one of the schools. These tests were made by means of a mirror held in front of the eyes of the pupil while he read a chosen paragraph of matter appropriate to his grade. Looking at the reflection of the subject's eyes in the mirror, the examiner counted the eye pauses in each line, estimated the length of the pauses as long, short, or average, counted the number of regressive movements, and estimated the length of the regressive movements. These data for each line were recorded upon a sheet with the pupil's name and grade and the selection chosen. The young lady who made the observations went through a considerable period of practice to prepare herself for accurate work. It was intended to make such examinations of some of the poor readers in every school, but the work of examining was unavoidably retarded, and the returns from this first school were not received in time to be used in the diagnosis. However, to show the aid

that may be given to individual analysis in some cases, the eye-movement records of two pupils are discussed. Chart VII shows the records of two pupils taken from the class sheet, together with the medians of their respective grades. The explanation of the class sheet is given in the description of Chart VIII.

CHART VII

Class Sheet Records of A. I. and D. L.

	Grade	Rate	Comp.	Oral	Span	Interpretation—Suggestions
Class median..	IV	67	10.6	47		
A. I.....	4B	44	6.9	1.6 24	.18 10	Slow reader. Nervous. Q. P. Eyes? Much home practice. Close inspection. Word structure.
Class median..	V	76	16	48		
D. L.....	5A	67	11	3 68	.80 0	Slow reader. Training in speed. May be due to extreme care.

An examination of A. I.'s oral rate shows that her poor silent rate is due to faulty word recognition. This diagnosis is further confirmed by the very low percentage of words read in the test for span of perception, though the ten exposures missed entirely suggested that her eyesight might not be good. No further effort at diagnosis was needed in this case. Her eye-movement record sheet merely confirms the diagnosis by showing an average of 9.7 pauses per line and eleven regressive movements to ten lines. On the other hand, an examination of D. L.'s oral rate and score is baffling to one seeking an explanation of her low rate of 67 in comparison with a class median of 76. Her oral rate and score are unusually good, with the score considerably above the standard for her class. The record for the span of perception is at one with the oral record in indicating that D. L. does not suffer in the least in respect to word recognition. It was thought that perhaps her silent reading rate was an accident, but careful observation of her during silent speed drills of the class showed that she was regularly slower than half the class. The mystery is solved in the record of her eye-movements. This shows that she has a little over six pauses to the line and averages one regressive movement to each line, never making more than two. A good reader in the fifth grade, one whose eye habits show the development that might be expected for that grade, ought not to have as many as six pauses to the line. Her ten regressive movements in ten lines

are more than any other reader of the twenty-six showed, except A. I.; and this in spite of the fact that D. L. was a better reader both silently and orally than the twenty-five others. The number of pauses she makes to the line indicates that she carries over something of her oral habit into her silent practice. Just why she should make so many regressive movements is hard to explain. Perhaps she acquired the habit in oral reading, when the eye has plenty of time to make a regressive movement while waiting on the voice, or perhaps it is a habit induced by a natural slowness of interpretation or by the desire to be extremely careful. It would perhaps help in her case to explain the matter to her, and get her to do a great deal of silent reading of easy, interesting material with as much speed as possible.

Class Charts Chart VIII shows the class sheet made out for the fourth grade whose records in the test for perceptual span are shown in table VII. This sheet is of the same arrangement as all the class sheets, save that the column for the span of perception is blank on the sheets of those schools where the test was not given. The age of the pupil in years is placed at the right of the name. 4A in the grade column means the low fourth grade, while 4B refers to the high fourth. The next two columns contain the scores made in the silent test. In the oral column the upper figure is the rate in words per second, and the lower is the score. On the line for class median, the oral score is the standard published for that grade. In the span column the top figures mark the percentages of words correct; the middle, the number of exposures in which no word was read; and the bottom, the greatest number of words read in any one exposure.

This sheet is shown with crudities in it, because it shows the early method of procedure. In the column for interpretation and suggestions, the first line was written after examining the returns from the silent test before the oral and perception tests were given. The second and third lines contain the clearer diagnosis and suggested remedial procedure after examining the evidence of the oral and perception tests. In class sheets made out later in the investigation, only the interpretation of the pupil's reading ability was written after examination of the silent test paper. No effort at diagnosis or prescription was made until after the oral test. *Q. P.* meant quick perception to the investigators, and stands for

CHART VIII

Class Sheet Fourth Grade

Names	Grade	Rate	Comp.	Oral	Span	Interpretation—Suggestions
Class median..	4	54	8.6	47		
10 C. I.....	4A	31	2.7	2.7 49	.25 8 4	Poor ability. Tr. in recog. and comp. Tr. in speed and comp. in silent reading. Q. P. or eyes. Close inspection.
10 W. J.....	4A	31	3.9	1.4 37	.23 3 3	Poor ability. Tr. in recog. and comp. Close inspection. Word structure. Q. P.
10 D. W.....	4A	37	5.0	.....	.....	Slow reader. Tr. in recog. or speed.
10 N. M.....	4A	44	4.2	2.4 37	.10 11 1	Poor ability. Tr. in recog. and comp. Slow in recog. Miscalls words, sometimes destroying sense. Q. P. or eyes. Close inspection.
L. B.....	4A	37	5.3	2.7 55	.42 2 4	Slow reader. Tr. in recog. or speed. Speed and quick interpretation in silent.
9 O. M.....	4A	31	5.3	.....	.....	Slow reader. Tr. in recog. or speed.
10 W. V.....	4A	31	5.3	1.3 14	.16 10 2	Slow reader. Tr. in recog. or speed. Slow and inaccurate recog. Subjective. Eyes. Close inspection. Word structure.
10 Y. F.....	4B	37	5.4	3 49	.28 8 3	Slow reader. Tr. in recog. or speed. Reads rapidly orally. Needs some training in word structure. Speed and quick interpretation. Eyes.
11 W. A.....	4A	44	5.5	2.1 31	.48 48 4	Poor ability. Tr. in recog. and comp. Tr. in word structure and accurate recog.
9 P. C.....	4B	44	6.7	3	.54 4 5	Slow reader. Tr. in recog. or speed. Speed in silent.
R. C.....	4B	54	7.1	2 40	.41 2 3	Poor comp. Word structure. Close inspection. Breathing.
G. P.....	4A	54	7.1	2.5 67	.53 1 4	Poor comp. Oral shows up well.
L. I.....	4A	44	8.2	1.6 42	.33 4 3	Slow careful reader. Tr. in recog. or speed. Word structure and quick recog. Practice. Naturally slow.

training by means of short exposure methods, prescribed when the data of the perception test seemed to warrant it. This was omitted from later sheets. *Eyes* means that the teacher should consider the advisability of having the pupil's eyes examined. This was suggested when a large number of exposures was missed entirely in the perception test, or when indications of eye trouble were noted during the oral test. *Close inspection* and *accurate recognition* stand for training in the careful inspection of words before pronouncing them. Such training was prescribed for those pupils whose oral sheets showed a good deal of inaccuracy.

An examination of one or two individual cases shows the increased clarity of understanding gained from the oral test. In the case of C. I. the interpretation from the silent test is "poor ability," with a suggestion of training in word recognition and comprehension. In the oral test she made such a good showing it was seen that she needed no special training in word recognition, but training in speed of silent reading. However, since her oral sheet showed a number of inaccuracies, she was marked for training in the careful inspection of words. Since she missed eight exposures of the perception test entirely, it was thought that her vision was not good, or that she was badly in need of training with short-exposure methods. In the case of R. C., the silent reading test showed poor comprehension. The oral reading test showed that his poor comprehension was perhaps due to the fact that he read slowly and inaccurately; consequently, he was marked for training in word structure and the careful inspection of words. The oral examiner noted on the test paper that he seemed to have trouble with breathing during oral reading.

Instruction to Teachers

Remedial Charts Chart IX is the remedial sheet for this same fourth grade. Such sheets, made from the data of the class sheet, were compiled for every grade and given to the principal of the school in question with the suggestion that he arrange for such training for the pupils as was indicated upon the remedial sheet. To the right of each name, the oral rate is given, and *Q. P.* marked if short exposure training was deemed necessary. Any other individual comments were put here also. The second and third groups were both intended for training in word structure; the

"intensive training" group, for fundamental training in phonics, word structure and form; the "increased vocabulary" group, for a less fundamental training in phonics, word structure and form, with the purpose of increasing immediately their reading vocabulary. Decision as to which group a pupil should be placed in was usually based upon his oral rate. If the rate was below 2 words per second he was placed in the first group, unless his oral score was comparatively high or some other evidence showed that he did not need the more fundamental training. For instance, L. I. was placed in the "increased vocabulary" group in spite of his low rate of 1.6 because his oral reading showed to the examiner that he understood well how to work out a new word. His difficulty seemed to be a lack of practice, and, therefore, an inadequate reading vocabulary of instant recognition.

CHART IX

Remedial Sheet—Fourth Grade

Eyes Examined:
C. I., N. M., W. V., Y. F.

Intensive Training in Word Structure:
W. J.—1.4 Q. P.: W. V.—1.3 Q. P.

Increased Vocabulary:

N. M.—2.4	Q. P.	L. I.—1.6	Q. P. (Practice)
Y. F.—3.		R. C.—2.	(Breathing)
W. A.—2.1		L. W.—	Q. P. (Practice)

Training in Accurate Recognition:
C. I.—2.7 Q. P. N. M., W. A., W. J.
W. V., R. C.

Training in Accuracy of Interpretation:
C. I., W. J., W. A., R. C., G. P.

Training in Silent Speed and Quick Interpretation:
L. B.—2.7 Y. F.—3.
P. C.—3.

Types of Training Suggested The first passage following, headed *Remedial Practices,* is the description of the types of training to be used with the children of the various groups given on the remedial sheet. Many of the methods suggested have been used by teachers in regular work. Most of them have been mentioned by others who have attempted special training of poor readers. Typewritten copies of this, together with the remedial sheets for their schools, were given to the principals in sufficient number for each of the teachers who would be engaged in the remedial work that was to be organized to have a copy. At the same time, it was explained to the principals that the needs of the pupils as shown on the remedial sheet were to be modified, perhaps, and

supplemented in the light of the full personal knowledge that the teachers had of their pupils. It was recognized that there were certain to be instances where, in either the silent or the oral test, the pupil would not show his true ability. It was evident that in some cases a second silent test should have been given, but this was precluded by lack of time. If the showing of the silent test had been untrue, the teacher would be able to know it from her intimate knowledge of the pupil's work. It was also explained that it would be better for the special training to be organized in small groups. This delivery of remedial sheets and instructions was followed in a little more than a week by a letter to each of the teachers chosen by the principals. The letter, which appears in the second passage, will explain itself.

Remedial Practices

I Intensive training in word structure

Give training in phonics and word analysis. Train the pupil to work out unknown words syllable by syllable. As much practice in oral reading both at home and school as possible.

II Increased vocabulary

This is training in word structure also, but a less fundamental type is needed. Train in the power to work out a new word. Make lists of words which pupils do not recognize immediately, for training in ready recognition and comprehension. These lists should be typewritten and frequently practiced upon by the pupil. As much practice in oral reading as possible.

III Training in accurate recognition

Urge a close inspection of words before pronouncing them. Keep the thought of the selection uppermost, so that the pupil will feel the meaning-destroying effect of substitutions, insertions, and omissions. This can be done by close questioning.

Let the group read competitively, counting the number of errors in a given amount of matter. Let pupils read until an error is made, to see how many lines can be read perfectly.

Use the "looking ahead" device described under VI. At the beginning of this type of training count the number of errors, including repetitions, made in reading a given passage. After two or three weeks, have the same passage read as a test of the success of the training.

IV Differentiation of words

This should be used in both cases I and III, that is for pupils who are being trained in the analysis of words and in accurate recognition. Typewritten lists of words like the following, compiled from the actual mistakes of children who confuse similar words and miscall syllables should be studied and practiced upon for immediate differentiation:

that	even	lying	fish
what	very	buying	fishing
when	these	quite	road
then	those	quiet	roads
how	they	tired	from
who	their	tried	for
them	now	certain	etc.
there	know	curtain	
every	close	farmer	
never	chose	farming	

V Training in quick perception, Q. P.

These are methods to widen the perceptual span and quicken the recognition of familiar words:

1. See that the book is held far enough away from the eyes for them to take in several words at a glance.

2. Eliminate all place-keeping devices.

3. Short exposure methods: Make flash cards by pasting on small cards phrases cut from current printed matter. Arouse competition among the pupils to see how many can get the phrase at a flash, or how many flashes are necessary for the recognition of the phrase. Small cards can be held close to the group. Large cards containing phrases cut from advertisements, handbills, etc., may be flashed upon a larger group at a greater distance.

Words written on the blackboard and covered, may be uncovered for a fraction of a second.

VI Training in Accuracy of interpretation

1. Reading carefully, emphasizing the elements upon which meaning depends; *e. g.*, topic sentence, relational words, and effect of different phrases and clauses. This is to be oral with questions and instructions by the teacher.

2. Reading competitively in silence to answer definite questions,

or to tell everything in the passage. Searching for essential points in any subject.

3. Making the phrase the unit of meaning. (a) Have group pick out the meaningful phrases in matter under discussion. Have matter read properly, showing the grouping of the words in the phrase by means of the voice. (b) In oral reading have pupil look ahead to be sure that he can read through the next meaningful group of words before uttering them.

4. Building a background of meaning. An intensive study of word and phrase; of prefixes, suffixes, roots, synonyms, and equivalent idiomatic phrases. This is somewhat the same method as that described under II, but the emphasis here is upon meaning rather than recognition.

These methods will not all be used perhaps with any group, nor with every individual in the group. The method, or methods, to be used must be chosen by the teacher with reference to the needs of the group, and only the teacher who works with them daily is capable of choosing. Perhaps the methods most used will be numbers 1 and 2, with number 2 the most common. Some individual pupils, however, will need the prescriptions of numbers 3 and 4.

VII Silent speed and quick interpretation—drills

1. Short selections to be read in a given time, or read competitively to see how soon they can be finished. These should be timed to the second, and the rates of the different pupils made known. Questions must be asked or reproduction demanded to insure thought concentration. This should sometimes be written, sometimes oral.

2. Longer selections to be read rapidly for the story or to find a certain number of interesting facts.

VIII Type of material

All the exercises preceding require interesting material well within the comprehension of the pupils. This may be found in the grade readers, supplementary readers, readers of a lower grade, geography readers, histories, easy hygiene texts, or children's story books. Whatever is used, it must be carefully selected beforehand. To depend upon the inspiration of the moment to choose the practice matter will seriously endanger the success of the work. The selection of the material is one of the most difficult and essential phases of the teacher's remedial efforts.

In the training for comprehension a somewhat more difficult material, though no less interesting, may be used.

IX Outside reading

The pupil who reads only his school books will never learn to read. The more home reading the group does, either for pure pleasure or under the stimulus of ambition to learn to read, the more bountifully will the teacher's efforts at training be rewarded. Everything possible should be done to induce home reading. A room library made up of the books owned by individual pupils, a group library, a book lent by some other pupil, or selected out of the school library—these, together with interesting short stories, may help.

X Fathers and mothers

The teacher should not fail to tell the parents what she is trying to do for the pupil. They will appreciate it, and with a little advice on her part they may help. Many will be glad to buy suitable reading matter.

She should find out whether the parents read to the pupil. If they do, the teacher should insist that such a practice be stopped by showing them the damage they are doing their child.

LETTER TO TEACHERS

Additional Suggestions as to the Remedial Work in Reading.

The two groups in word study were divided on the basis of rate. The slower ones were grouped under the heading, "Intensive Training in Word Structure," and the faster readers under "Increased Vocabulary."

As the heading of the group indicates, the pupils in the increased vocabulary group need an increased reading vocabulary, for they have not mastered certain words which appear in their regular grade reading. Few of them will need much training in phonics and word analysis over what is regularly given in their class. Some of them need only a great deal of practice in both oral and silent reading for greater familiarity with words and quicker recognition.

Both of these groups should be given practice in quick perception, whether their names have the letters "Q. P." after them or not.

Both of these groups should also be given training in comprehension by one or more of the methods described under VI on the sheets describing remedial practices. They should also be given

training in silent speed and quick interpretation. The pupils who were listed in the group for accuracy of interpretation were those whose achievement in comprehension fell noticeably below their achievement in rate; and the pupils placed in the group for training in silent speed were those whose silent rate seemed much slower than their oral rate warranted. However, all of the children whose achievements in reading are poor because of slow or imperfect word recognition, certainly need both types of training in silent reading—that is, training in comprehension and in speed.

If the teacher is conducting regular silent reading lessons for the whole class, these regular exercises may afford sufficient practice for the special group. However, the very slow readers should have easier material than the regular grade reading. Pupils cannot receive much benefit from practice in comprehension and silent speed when so much of their energy must go into the work of word recognition. In most cases a reader for a lower grade will be more suitable for their silent practice than their own reader.

In a few individual cases difficult breathing was noted on the sheet. This noticeable breathing may be due to an extra effort on the child's part to recognize the words, and in such a case will perhaps disappear with greater familiarity with words. In all of these cases, however, it will be well to give training in proper breathing. This may be done very much as the vocal teacher does it, by marking in the paragraph to be read certain natural pauses and directing the pupil to breath at the points marked. This connects breathing directly with interpretation.

I hope that each teacher will keep a record of the types of training she uses and the time given to them. This will enable us to pick out the methods of procedure that were most helpful. The pupils should be tested, after the special training has been given for two or three weeks, to see if it is beginning to be successful. I shall try to get some of the W. S. Gray oral sheets for testing in oral accuracy and rate. With a half hour's study any teacher can use these easily. The speed and comprehension drills given in silent reading will in themselves probably give the teacher sufficient evidence of their effectiveness.

(Signed) S. M. Lloyd.

CHAPTER V

REMEDIAL TRAINING

Before the examination of the groups of pupils who received special training is taken up it should be explained that the work was of briefer duration than was desired. The work of diagnosis and prescription required a great deal of time, especially since the technique had to be developed. Besides, circumstances over which the investigators had no control threw them almost a month later than they otherwise would have been in taking up this work. Just as the results of the analysis were placed in the hands of the principals, all the schools in the city were engaged in preparation for an open air fete to be presented by each school. This absorbed the extra time and energy of the teachers, and, for the most part, the groups were not well organized until after this fete was over. Most of the groups received not more than four weeks of training before the May test was given. In those cases where the training extended over a longer period, that fact is indicated in the description.

In the discussions which follow, comparisons are made by the scores in comprehension usually, and the improvement in individuals and groups is regularly computed upon the comprehension scores. This is done not only because comprehension is the chief desideratum in reading, but because the score in comprehension embraces also the rate. Rate in the Monroe test papers is merely an expression of quantity, and that quantity is shown just as well by the mounting score in comprehension. The only cases where attention needs to be given to the rate score are those cases in which there is a notable discrepancy between the quantity a pupil's eyes passed over as shown in the rate score and the quantity he actually read as shown in the comprehension score. Such of these cases, either individual or group, as deserve it are given mention in the descriptions which follow. In order that the explanation just given may be clear and that data may be at hand for reference if it is desired to look into the meaning of certain scores, the scheme of rate and comprehension for the test papers for the third, fourth, and fifth grades used in the May test is given in Table VIII. A pupil is given the full rate value for every exercise he passes over, but is given the comprehension values only for

those whose questions he answers correctly. The sum of the different values allowed him in rate make his rate score, and a similar sum his comprehension score.

TABLE VIII

Scoring Scheme of Test 1, Form 2

Rate Value	Exercises	Comprehension Value
9	No. 1	1.1
9	No. 2	1.1
6	No. 3	1.3
7	No. 4	1.4
5	No. 5	1.4
5	No. 6	1.5
11	No. 7	1.7
9	No. 8	1.8
8	No. 9	2.3
7	No. 10	2.1
14	No. 11	2.4
5	No. 12	2.5
8	No. 13	2.6
10	No. 14	2.8
10	No. 15	3.5

Special Groups in the Third Grade

School I The number of pupils listed for special attention in the 3B grade at School I was twelve. Miss A, the teacher, was urged to take about four of them for special training; but, since they were all in her room and she felt responsible for the reading advancement of all, she was unwilling to limit her efforts to a few, and undertook to give special training to all of the twelve. According to her description of the method used, she divided her entire grade into three sections, having this group, the *C* section, recite the regular reading lesson after the others had finished and had been put at other work. She gave regular instruction to the entire class in phonics and syllabication at the beginning of the reading period. When the *C* section was called she intensified and elaborated this instruction. She used the suggested scheme of differentiation of words with the special class, giving particular attention to those who needed it most. Together with this practice in differentiation, she emphasized the spelling of common words, and was rewarded by seeing the composition work of the members of the group become as good in spelling as that of the best pupils in the room. Silent exercises in comprehension were used several times a week for the entire class. When the testing was oral, as it usually was, she used the easier passages with those

of the special group who were weak in interpretation. No definite speed drills were used. After about half of the special training period had passed, the improvement of some of the group was so satisfactory that she placed them in the B section. The special pupils were kept supplied with easy and interesting books from the library during the last half of the period of remedial training. Such books in sufficient number were not available during the first three weeks of the training period. She was careful to talk to the parents about the children, and in several cases she stopped the practice of reading to them. Miss A felt that the common knowledge of parent and child as to the child's weakness, and the discontinuance of reading to the child in those cases where the practice existed, were great aids in the child's improvement.

Table IX gives the results of her work with the ten pupils who were present at the May test. The second column shows the type

TABLE IX

Improvement of 3B Group—Miss A

Pupils	Recom.	January			May			Gain	
		R	C	O	R	C	O	C	%
Class	.....	.....	5.3	.....	.....	11.3	.....	6.0	113
T. L.	w, r, i.	31	1.4	4 1.3	61	11.3	49	9.9	707
B. E.	w.....	22	2.6	19 1.4	76	6.0	32	3.4	130
N. C.	w.....	22	1.3	0 1.3	52	8.2	12 1.5	6.9	530
B. L.	w.....	22	3.9	13 1.4	41	7.8	40 2.4	3.9	100
T. L.	w, r....	37	5.3	19 1.3	69	13.6	46	7.3	156
W. V.	v, r, i..	22	2.6	16 2.0	36	6.3	27 2.6	3.7	142
C. R.	v, r, i..	22	2.6	16 2	41	6.5	27 2	3.9	150
S. W.	v.....	31	3.9	32 2	69	31.6	50 2	9.7	248
C. L.	v.....	31	5.3	31 2	61	11.3	51 2.4	6.0	113
C. M.	v.....	31	5.3	10 2	61	11.3	42 2	6.0	113
Average	.....	26.4	3.4	16	56.7	9.6	39.6	6.67	180

w—word structure i—accuracy of interpretation v—increased vocabulary
r—accuracy of recognition

of training recommended for each pupil. The next two columns of the table contain the scores made by the pupils in the January test in rate and comprehension. The column headed O shows the oral score and the oral rate in words per second. These data were procured from the oral test given some weeks later than the silent. The top figure in the oral column is the score; the bottom, the rate. The next three columns show similar figures for the May tests. The oral test was given several days before the silent. The last two columns show the improvement in comprehension in units and in percentage of the January score. The first line shows the median score of the entire class to which the group belonged.

In making significant comparisons, it will be noted that the gain of individuals in both units and percentage differs greatly; that the average gain of the group in units is somewhat greater than that of the class; and that the gain in percentage for the group is considerably greater than that of the class. It must be borne in mind in comparing the scores of the group with the class median that the gain made by the group helped make the class gain as high as it is. One of the most gratifying improvements is shown in the oral reading. Every one of the group, save three, made a score near or above the standard in the oral test, although the scores of all were exceedingly low in January. This improvement in oral reading in itself is ample justification for all the special attention which was given them, for faulty word recognition was the source of their reading troubles. When the pupils are considered individually, it will be noted that the absolute gain in comprehension of four of the group was less than that of the class, but the percentage gain of three of these was more than that of the class. It was not to be expected that every one of the group would improve as much as the average of the class in absolute units. For all of them the ordinary class instruction had in a measure failed. This failure was due in some cases, evidently, to lack of native ability. It seems unreasonable to expect that special training, no matter how excellent, will bring as many absolute units of improvement as the class receives on the average to pupils whose native ability is not good and whose previous attainment is much lower than the class average. Percentage of improvement appears to be the most accurate method of comparison. In only one case is this percentage less than that of the class; hence, for

this pupil the special training may be considered a partial failure as far as silent reading is concerned. Just how much improvement she would have made without special training is problematical. It is to be noted, however, that this pupil, B. L., improved wonderfully in oral reading. Few of the members of the group seemed to make as great increase in silent reading as their improvement in oral reading warranted. This may be due to the fact that the class was not given drills in rapid silent reading and quick interpretation. The case of N. C. deserves special attention. Her eyesight is so poor that it is impossible to make a good reader out of her; but, although she does not show great improvement in oral reading, she offsets this with a fine showing in speed and comprehension in silent reading. In other words, she has gone a long way toward mastering the art of getting the thought, even though her eyes will not allow her to read with much oral accuracy.

School IV Table X shows in the same way the results of the special training given by Miss B in the 3B grade at School IV. The only description she gave of the character of the work obtained was that she followed the suggestions of the circular and letter on remedial practices. There is no column for the oral test in May in this table, nor in any of the tables following. An effort was made to give these tests to all of the special pupils, but it had to be abandoned because of several inconveniences. The 3B group at School I was the only group examined in sufficient number to make the use of the scores worth while. This group had made such a poor showing in oral reading that it was felt the second oral test could not be omitted.

Miss B's group, it will be noted, did not gain as many units in comprehension as did the class, but made a considerably greater percentage of increase. It is interesting to compare this special group with the one which has just been discussed. The average January score in comprehension for Miss A's group, *3.4*, is somewhat higher than the score of *2.5* for Miss B's group; while the oral score of *16* for the former is so low as to be hardly comparable to the score of *46.5* for the latter. In other words, the cause for weakness in Miss A's group was insufficient ability in the mechanics of reading, while the weakness of Miss B's group in general was due to lack of ability in reading for meaning. This is re-

TABLE X

Improvement of 3B Group—Miss B

Pupils	Recom.	January			May		Gain	
		R	C	O	R	C	C	%
Class	.....	.....	4.95	.....	.....	11.9	6.95	140
B. E.	i.....	44	0	.....	41	6.3	6.3	∞ *
B. W.	v.....	31	1.4	44 2.4	61	6.7	5.3	378
B. F.	w.....	22	1.3	37 1.6	52	6.8	5.3	423
C. C.	s. s....	22	3.9	52 2.8	76	8.5	4.6	318
E. C.	w, r....	31	1.4	33 1.2	41	7.8	6.4	457
R. F.	s. s....	31	4.0	52 3	76	13.6	9.6	240
S. M.	i.....	44	2.6	51 2	76	7.4	4.8	184
S. D.	r, i....	127	6.9	61 2.7	76	9.8	2.9	42
E. L.	v, r....	22	1.3	42 2	41	6.3	5.0	384
Average	.....	41.5	2.5	46.5	60	8.1	5.6	221

w—word structure i—accuracy of interpretation v—increased vocabulary
r—accuracy of recognition s. s.—silent speed and quick interpretation
*The sign of infinity is used in those cases where the percentage cannot be computed since the basic score is zero.

flected in the column of recommendations. Every one of the group under Miss A is recommended first for training in the mechanics of reading, while over half of the group under Miss B has no recommendation whatever for such training. Instead, the recommendations are mostly for training in rapid silent reading, accuracy of interpretation, and accuracy of recognition. This group needed training particularly in silent reading. Some special cases deserve comment. B. E., who was recommended for training in interpretation, shows a lower rate for May but an infinitely better showing in comprehension. His score for comprehension is perfect; that is, he answered correctly every exercise attempted. For him, then, the training was an unqualified success. S. M., with the same recommendation of training in accuracy of interpretation, answered correctly five exercises out of ten in May as against two out of six in January, raising his ratio of comprehension from one-third to one-half. S. C., with only

42 per cent of increase, appears to be a failure; but when it is noted that his score in rate was lowered from 127 to 76, while at the same time his score in comprehension was raised from 6.9 to 9.8, it will be seen that he has become a much more careful and efficient reader. In the January test he attempted fifteen exercises, reading only three of them correctly, while in the May test he read ten exercises and answered seven of them correctly. He was recommended for training in accuracy of interpretation and accuracy of recognition, and these scores show that his training proved thoroughly successful.

Another pupil, B. W., in this same grade in January, with a rate of 22, comprehension 0, and an oral score of 40, was recommended for training in interpretation. She was retained in the 3A grade, and, therefore, did not work with this group. Her scores in the May test were 69 and 12.3, respectively. Her teacher reported that her improvement was due to the fact that she was retained in the same grade, read three supplementary readers, and was given special attention in a small class.

School III Table XI shows the record of the 3B group trained by Miss C at School III. This teacher had both sections of the third grade in her room, and was unable to organize this group into a special section. It is reported by both Miss C and her principal, however, that she gave special attention to the individual pupils of this group in the regular class, and followed in general the recommendations of the sheet of instructions. The group as a whole shows gratifying improvement when compared with the groups already treated, and particularly as compared with the advancement made by the whole class. The 400 per cent increase includes the scores of the two pupils who made zero on the first test. However, even if these scores are excluded, the percentage is 231, which in comparison with the 100 per cent for the whole class makes an unusually good showing. This group showed a much greater gain in actual units, especially as compared with the class gain, than any of the groups so far considered. The two children recommended for training in interpretation, H. L. and P. A., deserve notice. In the first test H. L. answered one question out of three correctly, while P. A. answered three out of nine. In the second test H. L. was perfect on the seven exercises attempted, and P. A. correct for eight out of twelve. H. L.'s ratio

increased from one-third to one, while P. A.'s ratio increased from one-third to two-thirds.

TABLE XI

3B Group—Miss C

Pupils	Recom.	January			May		Gain	
		R	C	O	R	C	C	%
Class	.....	.....	5.4	.....	.....	10.8	5.4	100
H. W.	w.....	0	0	26 0.8	61	10.0	10.0	∞
H. L.	w, i....	22	1.3	36 1.3	41	7.8	6.5	500
W. S.	w, r....	8	0	25 1.5	41	3.9	3.9	∞
J. H.	v.....	31	1.3	49 2.4	61	11.3	10	769
B. N.	w, r....	15	2.6	40 1.1	61	10.0	7.4	284
E. E.	v.....	31	3.9	42 2	76	5.6	1.7	43
P. A.	r, i....	67	5.0	42 3	95	12.0	7.0	140
Average	.....	24.8	2.1	37	62.2	10.2	8.1	400

School II The special group under the instruction of Miss D at school II, as shown in Table XII, is complex. The first two pupils are repeaters in the 3A grade. The other two are in the 3B. Miss D taught both of these grades in the same room. She turned in these names as those of pupils to whom she gave special attention. She reported that practice in comprehension and silent speed was given to the room as a whole, with particular notice of those listed in Table XII. Flash-card drill was given to S. B. and B. W. No report was made of any extra instruction in phonics and word structure. Perhaps it was expected that, since K. D. and M. J. repeated the 3A grade, they would get what they needed in the regular instruction of that class. This may be doubted, however, when the scores of these two are compared with the median score of the 3A grade in May, 9.3. This score is higher than that of the 3B, and is so excellent as to indicate that two such slow pupils as K. D. and M. J. were at a disadvantage in the class. In spite of their small improvement in the comprehension score, which appears sufficiently large when marked by the sign of infinity, they make a poor showing. K. D. was cor-

TABLE XII

Improvement of 3B Group—Miss D

Pupils	Recom.	January			May		Gain	
		R	C	O	R	C	C	%
3A						9.3	(1)	
K. D	w	59	0	15 1.1	76	5.8	5.8	∞
M. J	w	54	0	20 0.9	123	4.2	4.2	∞
3B			3.9			8.4	4.5	115
S. B	w	31	1.4	35 1.1	36	6.3	4.9	350
B. W	r, i	22	0	46 2	61	10.2	10.2	∞ (2)

(1) The 3A grade of May was the 2B grade at the time of the January test and received no test.
(2) No averages are given because of the smallness of the groups and the impossibility of computing percentages.

rect in only three out of fifteen exercises attempted; M. J. in only three out of nine. Their habit of getting over a great deal of matter without obtaining any meaning has not improved much. Their oral scores showed plainly that they had not even read the words of the comparatively large amount of matter indicated by their rate scores in January. Consequently, they were recommended for intensive training in the mechanics of reading. Presumably, they improved somewhat in the mechanics of reading, for they ran over in their careless fashion a good deal more matter in May than in January. Possibly the speed drills in a class much above them in ability tended to confirm in them a senseless increasing of their rate beyond the point of real recognition and assimilation. Probably, however, they are of a type of mind which cannot be improved much, no matter how earnest the efforts of the teacher. In contrast with these two, the improvement shown by S. B. and B. W. is gratifying. The score of the first in comprehension is perfect, showing that he actually read the matter his eyes traveled over. The scores of the second show a gratifying improvement in amount of matter read, and eight out of nine exercises were correct.

Results Checked The improvement of the special groups has been compared with the improvement of the classes to which these groups belonged. Table XIII introduces a comparison between

them and other pupils who were recommended for special training but did not receive it. These six are all of the 3B pupils to be found whose names were not returned to the investigator as having been given special attention. The groups are not exactly comparable, for the group of control cases does not contain so large a proportion of those needing training in the mechanics of reading as do the other groups. However, it is the best comparison that could be made, and certainly indicates greater improvement in reading ability for those who received the training suggested.

TABLE XIII

Improvement of 3B Control Cases

School	Pupils	Recom.	January			May		Gain	
			R	C	O	R	C	C	%
V	N. B.	w	31	3.9	37 1.5	52	7.0	3.1	79
V	S. M.	v	37	2.6	40 2.4	61	11.3	8.7	334
II	L. R.	w, r	15	1.3	32 1.2	36	2.5	1.2	92
II	L. A.	v, s, s.	15	2.6	45 2	52	7.8	5.2	207
II	N. T.	w, r	22	2.6	1.8	76	8.2	5.6	215
II	S. C.	i	44	1.3	52 2.3	103	2.6	1.3	100
Average	Controls		27.3	2.4	41.3	63.3	6.5	4.1	175
Average	Specials		32.6	2.4	31.2	61.3	8.5	6.1	253

Comparison shows that the trained group gained in comprehension 6.1 units as against 4.1 for the untrained, and 253 per cent as against 175 per cent. Since in the group of controls there are none who made zero in January, the contrast between these two percentages is hardly fair; but if we leave out of the computation every case of the specials who scored zero in January, even then their percentage of gain is 197. This last comparison is unfair to the specials, but serves to show conclusively the superior advantages of the special training.

Special Groups in the Fourth Grade

School IV Miss E. the 4B teacher at School IV, divided her class into three groups, using her own estimate of their ability

for the first two groups, and putting those recommended for special attention in group *C*. After groups *A* and *B* had recited their regular reading lesson, they were allowed to read silently material of their own choosing while she taught the *C* section. In addition, she took the special group from 8:30 to 9 every morning, a half hour just before the formal opening of school. In this period the chief exercise was the silent reading of material which was easier for, and more interesting to them, than the regular lesson. They were always allowed a choice of material, though sometimes all read the same selections. After reading, they reproduced or discussed the matter. Miss E also gave individual help where it was needed. Books from the school library were furnished them for outside reading, though how much of this was done is not known. Table XIV shows the results of her efforts. The percentage of gain, 127, compares very favorably with the 75 per cent for the whole class, particularly when it is borne in mind that the gain of this group is computed in the gain of the class. Two failures, however, are in this group. Special training of M. L. should be counted a failure, since the percentage of gain does not reach that of the class, while the positive loss of L. M. speaks for itself. This statistical loss may be accidental, for every teacher knows

TABLE XIV

Improvement of 4B Group—Miss E

Pupils	Recom.	January			May		Gain	
		R	C	O	R	C	C	%
Class	.....	.....	9.0	.....	.....	15.7	6.7	75
T. M.	w, i....	37	4.0	37 1.2	76	15.7	11.7	242
S. A.	w.....	31	5.3	40 1.0	61	11.3	6.0	113
T. M.	r.....	54	5.8	31 1.7	90	12.3	6.5	112
D. F.	w, i....	44	5.5	42 1.1	76	15.7	10.2	185
M. L.	v.....	54	8.6	56 2.3	90	12.2	3.6	41
R. J.	w, r....	31	2.7	34 1.5	76	15.7	13.0	480
L. M.	s. s....	37	6.7	.....	36	5.0	−1.7	−34
Average	.....	41.1	5.5	40	72.1	12.5	7.0	127

that even a good pupil sometimes makes a poor showing in a test. In the same way, however, it may be true that the very low score of R. J. in January, as compared with his May score, may be an accident. In that event, the two accidents would in a measure offset each other.

School III Table XV shows a fourth grade group instructed by Miss F at School III. The first two pupils were in the 4A grade and the other six in the 4B. The scores, which show the improvement of each class as a whole, are shown in the first two lines, but the averages at the bottom include all eight pupils. Miss F reports that, while with two grades in her room she could not organize these as a special group, she kept their names and needs constantly before her, gave them more time in the class than the others, and special attention in line with the training suggested. She reports particular training in rapid silent reading given to B. R. and F. J., with excellent results as the scores show. She reports particular efforts also in training P. H. and M. H. to

TABLE XV

Improvement of Fourth Grade Group—Miss F

Pupils	Recom.	January			May		Gain	
		R	C	O	R	C	C	%
4A Class	.....	.....	5.4	.....	.....	11.3	5.9	109
4B Class	.....	.....	7.3	.....	.....	13.6	6.3	86
F. J.	i.....	81	1.3	.....	61	11.3	10.0	769
H. W.	w, r....	37	5.4	.....	41	7.8	2.4	44
P. H.	w.....	44	4.1	.....	76	8.4	4.3	107
B. R.	w.....	44	2.7	34 1	76	11.3	8.6	318
H. M.	v.....	54	4.5	45 2	76	11.3	6.8	151
M. R.	w, r....	22	2.6	42 1.7	76	15.7	13.1	503
M. H.	w, r....	31	2.6	42 1.5	41	6.3	3.7	142
K. R.	w.....	31	0	.....	52	4.1	4.1	∞
Average	.....	43	2.9	41	62.3	9.5	6.6	228

read for meaning. M. H.'s showing is good as to accuracy, for he missed only one out of six reading problems in his second test as against two out of four in his first. P. H. was correct in three out of six in his first and six out of ten in his second, which shows very little improvement. Miss F attributes the poor success she attained in the case of K. R. to the fact that another language is spoken in the home. The increase in comprehension score and percentage of gain shown by the group as a whole is very gratifying.

School II Table XVI is brief, and speaks for itself. The report from Miss H as to her work was inadequate, but her principal had learned from her that she gave particular attention to these three pupils in the regular class. Whether E. L. received any extra training in the mechanics of reading can only be guessed at. The improvement shown by the three is certainly good, with the showing in units gained unusually high.

TABLE XVI

Improvement of 4B Group—Miss H

Pupils	Recom.	January			May		Gain	
		R	C	O	R	C	C	%
Class	.....	.....	8.2	.....	.....	13.2	5.0	61
E. L.	w.....	31	5.3	36 1.1	61	10.2	5.9	92
T. J.	i.....	44	5.4	52 2	103	17.7	12.3	227
D. C.	s. s....	37	6.7	73 2.4	123	24.6	17.9	265
Average	.....	37.3	5.8	53.6	95.6	17.5	11.7	201

Results Checked Table XVII introduces fourth grade control cases. Schools IV and V had pupils in the fourth grade chosen for special training. For some reason these pupils did not receive the training. All of the fourth grade pupils who were recommended for special training in School V were included. This school found it inexpedient to arrange for special training groups. The principal reported that he put three pupils in charge of a certain teacher, but since no report could ever be obtained from the teacher, and since this single group was so small, it was thought best to omit it from the reckoning. In the case of this fourth

grade, the teacher reported in answer to a special inquiry that she did not give special training to any group, although she gave more attention to silent reading in the class than formerly. The other members of the control group were chosen from School IV. The two, listed for "increased vocabulary," were the only two to be found recommended for training in the mechanics of reading—the type needed most to make the control group comparable to the special group. Since the group of controls still needed a pupil recommended for training in rapid silent reading, S. H., whose improvement was greater than that of any other similarly recommended pupil, was chosen. The group has been made as thoroughly comparable as possible to the specially trained groups, and every negative advantage allowed. The investigators feel that the inclusion of C. I., with her wonderful improvement, is hardly fair. She was recommended chiefly for training in interpretation; and, although she was not put in a group for special training by the school principal, her class received a great deal more training in silent reading than it had ever received before. This was the very

TABLE XVII

Improvement of Fourth Grade Control Cases

School	Pupils	Recom.	January			May		Gain	
			R	C	O	R	C	C	%
V	C. I.	i, r	31	2.7	49 2.7	123	21.1	18.4	644
V	W. J.	w	31	3.9	37 1.4	69	10.0	6.1	156
V	N. M.	v	44	4.2	37 2.4	61	8.5	4.3	102
V	W. M.	w	31	5.3	14 1.3	52	9.5	4.2	79
V	W. A.	v	44	5.5	31 2.1	69	8.8	3.3	60
V	G. P.	i	54	7.1	67 2.5	76	13.6	6.6	91
IV	J. B.	v	44	5.5	42 2	76	10.8	5.3	96
IV	B. C.	v	44	4.1	.....	76	10.2	6.1	151
IV	S. H.	s. s.	44	4.1	57 3.0	90	13.7	9.6	234
Average	Controls	.....	40.7	4.7	37	76.9	11.8	7.1	150
Average	Specials	.....	41.3	4.4	31.3	71.7	12.0	7.6	173

kind of training she needed, and, for that reason, it is hardly proper to consider her as a suitable member of the control group. The same criticism may be made of S. H. If C. I. is omitted from the control group, the total percentage of improvement is 139.

Special Groups in the Fifth and Sixth Grades

The discussions immediately following present the work done in grades V and VI. It was not possible to organize the remedial training in these grades as thoroughly as in the others for the reason that in most of the schools one teacher teaches all the reading classes of these grades, and is with the children only during the time of the recitation. Besides, since the reading is taught more from the standpoint of literature than in the lower grades, it is not so easy during the recitation to give some backward pupil the training he needs in the mechanics of reading. In one of the schools two changes in the teaching force entirely thwarted the plans for special training in these grades.

School I Table XVIII shows the results for four pupils in the 5A grade at School I. The reading teacher, Miss I, gave them what attention she could for the three weeks immediately preceding the May test. Her main effort was to get them to read as much easy and interesting material as possible. She furnished them with books of suitable stories, and gave them a few special lessons before school time, when they read short stories and reproduced or discussed them. They understood fairly well how to work out a new word, but were slow in recognition. The first

TABLE XVIII

Improvement of 5A Group—Miss I

Pupils	Recom.	January			May		Gain	
		R	C	O	R	C	C	%
Class	.....	.....	12.7	.....	.....	18.5	5.8	45
A. I	w.....	44	6.9	24 1.6	68	13.6	6.7	97
R. A	v.....	31	2.6	20 2.5	52	8.0	5.4	277
G. J	w.....	44	5.5	11 1.3	61	11.3	5.8	105
H. M	v.....	44	5.5	40 2.4	69	11.8	6.3	110
Average	.....	40.7	5.1	24	62.5	11.1	6.0	113

three were usually kept busy on their regular work with not as much time for easy reading as they needed. A special drill given to the whole class, to be described later, had something to do with the improvement they show; but, since they were pointed out and and the extra attention described above given them, it is proper to include them in the special groups. Their superior percentage of improvement in comprehension score, compared with that of the class, speaks positively for the special emphasis that Miss I placed upon their reading.

School IV Miss J of School IV managed the pupils whose scores are shown in Table XIX in somewhat the same fashion as Miss I. She gave no help, but tried to get them interested in reading both in and out of class. She furnished them with suitable books from the library, which they were allowed to read in spare time at school as well as at home, and held them responsible for the subject matter read. These children, it will be noted, are in different grades. The scores for the different grades showing class improvement are placed on the first three lines for purposes of comparison. The second pupil in the table, S. W., furnishes another example of failure. This may be a mere accident, but it is very probable that the increased emphasis upon speed in silent reading led him to a rate beyond his capacity. Some children seem unable in a short time to increase their speed in reading, and urging makes them poorer in comprehension. It is the task of the instructor to discover those who cannot be hurried except with injury and to adjust conditions of instruction to their needs.

School III Table XX presents two groups who received somewhat different treatment at the hands of Miss K, the principal of School III. She could not arrange to place these pupils under a teacher, and so took them herself for two days a week. The first six she worked with for only two weeks in this way. She had D. H. fitted with glasses, and compelled A. T. and W. P. to resume the wearing of theirs, which had been discontinued for some time. She gave the group some needed instruction in word structure, and stirred up their ambitions in the matter of reading rapidly and accurately. The six were then turned over to their regular reading teacher in the hope that the emphasis she had given the matter would carry them through to a real improvement. That it did in at least four cases is apparent from an examination

of the table. This illustrates again the fact mentioned by several of the teachers that the possession of the common knowledge by teacher, pupil, and parent of the child's weakness in reading, emphasized by the tests and by the teacher's solicitude, is in itself a factor that makes for improvement. With the last two pupils Miss K continued her special work twice a week until the close of school, thus devoting six or seven weeks of attention before the May test. With her own adjustments, she followed such suggestions of the sheet of remedial practices as fitted their cases. Attention to a few individual records may prove enlightening. I. M. shows the very kind of improvement sought. Listed for accuracy of interpretation, his rate remains the same, while his score for comprehension triples itself. C. W. shows poor progress. In the first test he read but three exercises, getting only one of them correct; in the second, he read seven, getting three correct. While this is an improvement in both rate and accuracy, it is a very poor showing for a fifth grade pupil.

TABLE XIX

Improvement of Fifth and Sixth Grade Groups—Miss J

Grade	Pupil	Recom.	January			May		Gain	
			R	C	O	R	C	C	%
5A				14.6			18.1	3.5	24
5B				13.7			18.95	5.25	38
6A				18.05			25.5	7.45	41
5A	R. R.	w.	37	2.7	15 1.2	76	8.1	5.4	200
5B	S. W.	w, i.	59	11.7	40 1.5	76	9.8	−1.9	−19
6A	W. T.	s. s.	67	11.9	54 2.4	115	27.3	15.4	121
6A	W. I.	s. s.	67	10.0		101	17.7	7.7	77
Average			57.5	9.0	36	92	15.6	6.6	73

E. J. shows a gratifying improvement similar to that of I. M. He reads a smaller amount of matter, but increased his comprehension score more than fivefold. The effort of G. A. to increase his speed resulted disastrously. This case is another instance showing that the teacher must be careful in urging a pupil to greater

speed in reading. His rate score of 101 in May represents almost twice as much matter as his score of 59 in January, but his comprehension score increased only from 11.7 to 12.8. G. A.'s trouble is purely that of slow assimilation, for his oral score of 51, with a rate of three words per second, shows that he has mastered the mechanics of reading.

School II Miss L of School II reports that she gave special attention in class to the pupils shown in Table XXI with respect to words, word structure, and the reproduction of the thought. Though she did not differentiate, it is to be supposed that she varied the emphasis to suit the needs of particular indivduals. The increase in comprehension score of 112 per cent for the group makes a good showing as against a percentage of 74 and 35 for the classes. One failure to improve in either rate or comprehension is noted in S. W. The training given S. A. seemed to be happily adjusted. Recommended for training in rapid silent reading, he increased his rate and comprehension equally, 105

TABLE XX

Improvement of Fifth and Sixth Grade Groups—Miss K

Grade	Pupil	Recom.	January			May		Gain	
			R	C	O	R	C	C	%
5A				12.4			13.6	1.2	9
6A				13.4			21.7	7.3	61
5A	I. M.	i.	76	3.3		76	10.0	6.7	203
5A	C. W.	w, r.	22	1.3	30 1	52	4.2	2.9	223
5A	E. J.	i.	67	1.8		61	9.5	7.7	427
6A	G. A.	s. s.	59	11.7	51 3	101	12.8	1.1	9.9
6A	A. T.	v, i.	61	12.4	42 3	115	24.1	11.7	94
6A	D. H.	i.	87	11.8	50 2.6	121	21.7	9.9	85
6A	W. P.	w.	44	5.6	17 1.7	73	10.7	5.1	91
6A	W. J.	v, i.	67	7.1		89	15.1	8.0	112
Average			60.3	6.8	38	86	13.5	6.7	96

per cent in rate and 103 per cent in comprehension. R. L. shows considerable carelessness in the May test. Nevertheless, his ratio of comprehension is somewhat better than in the January test, and the amount read and understood in May is so much greater that his training may be considered highly satisfactory. B. R. scored in February 5.3 out of a possible 6.7; in May he scored only 8.7 out of a possible 18.1. This is bad. Evidently his mastery of the mechanics of reading had not improved a great deal over that indicated by his score of 36 and rate of 1.2 in January, and in May he attempted to read an amount of matter entirely beyond his power of recognition and assimilation. It should be noted also that B. A., while showing great increase of speed, shows no improvement in accuracy of interpretation, but really a failure in the particular phase of reading for which he was listed. In January he scored *6.2* out of a possible *11.7*; in May, *15.1* out of *29.5*.

TABLE XXI

Improvement of Fifth Grade Group—Miss L

Grade	Pupil	Recom.	January			May		Gain	
			R	C	O	R	C	C	%
5A				8.65			15.1	6.45	74
5B				14.2			19.2	5.0	35
5A	B. A.	i.	59	42 6.2	2.6	123	15.1	8.9	127
5A	B. R.	w.	37	5.3	36 1.2	90	8.7	3.4	64
5A	R. L.	w.	22	1.3		113	12.3	11.0	846
5A	R. F.	v.	44	4.1		76	13.6	9.5	232
5A	S. A.	s. s.	37	6.7	55 2.5	76	13.6	6.9	103
5B	B. L.	w.	31	4.1	32 1.7	90	13.6	9.5	232
5B	F. P.	v.	44	6.9	45 2.4	76	12.3	5.4	78
5B	S. W.	r, i.	118	13.7		118	13.6	−.1	0
Average			49	6.0	42	82.7	12.8	6.8	112

Results Checked In seeking for fifth and sixth grade control cases among the pupils who were recommended for special train-

.ing, but who did not receive it, the investigators made every effort to have the contrasted groups comparable and to allow every legitimate negative advantage. The three 5A cases in Table XXII are all that were to be found in that grade. In choosing the 5B cases from Schools III and II, the investigators omitted those

TABLE XXII

Improvement of Fifth and Sixth Grade Control Cases

School	Grade	Pupil	Recom.	Janyary			May		Gain	
				R	C	O	R	C	C	%
Specials...	5A	.....	.....	43.3	4.1	30	75.3	10.7	6.6	162
IV.....	5A	F. J.....	s. s....	44	6.8	.....	76	12.3	.....	.....
III.....	5A	S. L.....	w, i....	44	5.5	22 1.7	61	10.2	.....	.....
III.....	5A	N. W.....	w.....	37	6.7	24 1.3	76	13.6	.....	.....
Average...	.....	.....	.....	31.2	6.3	23	71	12.0	5.7	90
Specials...	5B	.....	.....	63	9.1	39	90	12.3	3.2	35
I.....	5B	S. T.....	w.....	67	8.9	33 1.7	95	15.0	.....	.....
I.....	5B	C. A.....	w, i....	44	8.2	38 1	61	9.6	.....	.....
I.....	5B	B. L.....	i.....	59	11.7	.....	69	13.6	.....	.....
III.....	5B	P. L.....	v.....	67	12.3	52 2.4	90	13.4	.....	.....
Average...	.....	.....	.....	59.2	10.2	41	78.7	12.9	2.8	23
Specials...	6A	.....	.....	64.5	10.0	43	102.1	18.4	8.4	83
II.....	6A	D. J.....	i.....	76	5.8	.....	73	12.9	.....	.....
II.....	6A	H. W.....	i.....	87	8.2	65 3	141	9.6	.....	.....
II.....	6A	M. M.....	s. s....	44	8.2	.....	44	8.2	.....	.....
II.....	6A	A. L.....	w, i....	98	8.3	32 1.8	115	11.3	.....	.....
II.....	6A	M. A.....	i.....	76	8.5	54 2.5	54	9.6	.....	.....
II.....	6A	S. N.....	v.....	67	10.4	49 2.3	73	12.8	.....	.....
II.....	6A	S. W.....	w, r....	67	12.4	32 1.9	89	9.6	.....	.....
Average...	.....	.....	.....	73.5	8.8	46	84.1	10.5	1.7	19

marked *s. s.* because no such recommendations for practice appears along with the individual pupils to whom training was given. There were two 6A groups of fair size and sufficiently varied recommendation which might be used entire. One of these was from School V and one from School II. The School II group was chosen because it made a greater improvement than the School V group. On the line at the head of each grade group the average scores for the specials of that grade are given.

Comparisons with Other Schools

In the preceding part of this chapter the results from trained pupils have been compared with the results from other pupils in the same schools who were low enough in reading score to be chosen for special training, but who did not receive it. It remains to compare the results from the specially trained groups with the results from pupils who showed reading ability in about the same degree as those pupils in the specially trained groups and who were in schools where no remedial work was attempted. These were Schools VI, VII, VIII, and IX. From these schools the lowest third of the pupils in each of grades III, IV, and V as shown in the January test were selected, and their percentage of improvement in comprehension computed. It should be borne in mind, while making these comparisons, that, though no remedial work was attempted by the investigators with these children, their names along with their scores for the test given in January were furnished to the principals. Doubtless, extra notice was given to some of them. At least, it is known that most of the teachers of these schools paid more attention to silent reading after the returns of the January test were made known than they ever had before. It is not to be expected that every group of children specially trained will show greater improvement than every group of similarly poor readers in like grades of these schools, particularly since some of the schools, because of earnest attention to reading, improved wonderfully in the May test. Therefore, in order to make the comparison as clear and as fair as possible, the increases of the specially trained groups and of the control groups, placed side by side, are each arranged in the order of their quantity. This is shown in Table XXIII, together with the total increases of each grade. Examination will show that two third

grade groups of the control schools make a better showing than two of the special groups, one of the fourth grade control groups better than one of the other, and one fifth grade control better than any of the specials. But the comparison of a majority of the individual groups and of the totals easily proves the advantage of special remedial work.

TABLE XXIII

Comparison with Similar Groups in Schools Without Remedial Work

Grade	Control Groups		Special Groups	
	School	%	%	School
III	VIII	325	400	III
III	VI	300	350	* II
III	VII	167	221	IV
III	IX	100	180	I
III	Average	199	253	
IV	VIII	148	228	III
IV	VII	124	201	II
IV	IX	111	127	IV
IV	VI	16	.....	.....
IV	Average	71	173	
V	VIII	163	113	I
V	VII	67	112	II
V	VI	42	96	III
V	IX	40	73	IV
V	Average	68	96	

*This percentage is 1792 if the three cases are included whose percentage is marked ∞

Special Class Procedure

Class Divided on Basis of Rate There remains to tell of two particular plans of class procedure. One of these was carried out in the 4B reading class by Miss M at School I. At the beginning of the second term she divided the class into three groups, according to rate. *A* readers were those who read sixteen lines or more per minute silently; *B* readers, twelve to sixteen lines; and *C* readers, less than twelve lines. After the *A* and *B* groups had finished the recitation of the reading lesson, they were allowed to read matter of their own choosing while the *C* group recited. Miss M was careful to call on each member of the *C* group to read every day. She estimated that she devoted an average of five minutes a day with all the class to the analysis of new words, phonics, and quick pronunciation. Drills in silent reading were given to the whole class several times a week. About once a week,

after discussion of the lesson for the day, which had already been prepared by the pupils, she allowed the *A* and *B* sections to read selections of their own silently while she gave special attention to the *C* section. For the practice at a period of this kind she generally chose an easy and interesting story. Miss M did not have library facilities until the last of the term, but gathered books together from the pupils. She reports that toward the last of the term those children who had never cared to read before were as eager as the others to get books from the library. She tested the pupils in rate the last week of the term and found that all except two in the *C* group had gained in speed from one to three lines per minute, and most of them two. Miss M was not given the list of poor readers in this grade, nor the sheet of suggestions. Later, when shown the list of poor readers that would have been handed her along with suggestions for remedial work, she said that most of them were in her *C* group.

Table XXIV contains the scores of those pupils from whom the special training group in her class would have been formed. Comparison of their improvement with that of the class shows for the most part superior improvement; 71 per cent for the group as a whole, and 37 per cent for the class. It is interesting to compare this work with the similar scheme of Miss E in the same grade.

TABLE XXIV

Improvement of 4B Group—Miss M

Pupil	Recom.	January			May		Gain	
		R	C	O	R	C	C	%
Class	.....	.....	9.9	.....	.....	13.6	3.7	37
P. P.	w, i, r..	44	5.5	18 1.8	76	11.3	5.8	105
L. M.	r, v....	44	8.2	40 1.8	76	9.7	1.5	18
P. F.	v.....	37	4.0	50 1.2	61	7.0	3.0	75
S. J.	r.....	54	7.3	25 3	76	11.3	4.0	54
S. N.	i, r....	54	6.9	42 3	103	12.3	5.4	78
E. E.	i.....	67	5.9	.....	76	13.4	7.5	127
Average	.....	50	6.3	35	78	10.8	4.5	71

Miss E's group gained seven units in comprehension, an increase of 127 per cent, as aganst 4.5 units and 71 per cent for the group under discussion. The difference in their treatment lies in the facts that Miss E's group had their difficulties analyzed with proved treatment pointed out, and that she gave twenty to thirty minutes a day over and above their regular class time. This explanation of the difference leaves out of account the difference that may exist in the genius of the teachers or the native ability and home conditions of the classes. That there was a difference in one or all of these factors is shown by the fact that Miss E's whole class jumped from a score of 9 in January to 15.7 in May, while Miss M's increased only from 9.9 to 13.6. Miss E's class made the highest score of any 4B grade in the city, and the greatest absolute and relative gain of any 4B grade, save that of School VIII.

Regular Speed Drills The other plan of class procedure to be described was carried out by Mr. Lloyd in School I. He tried an experiment in regular drill with comparatively easy matter for rapid silent reading and quick interpretation. During the last term he taught the 5A class in hygiene. The text used was an easy one for that grade and the lessons were very short. On at least four days in the week these lessons would be used as speed drills. Usually the children were asked to read the new lesson as rapidly as possible and to stand as soon as they had mastered it. Throughout the term this scheme never lost its interest. Sometimes the plan was varied by having them see how much they could read in one or two minutes. The pupils were held rigidly to the understanding and retention of the matter read. This was usually tested by oral question and answer, but for at least one-fifth of the time by written answer on blackboard or tablet. After the speed drill and test, the lesson would be amplified and illustrated as the needs of the class in hygiene demanded. How well the plan succeeded in raising the reading power of the class may be judged from consulting Table XXV. This shows the improvement in comprehension score of all the 5A grades of the schools in which remedial work was attempted. None of the other schools had scores for this grade near enough to School I to make comparison worth while. Two of them had no 5A grade. Examination will reveal that the score of School I is the highest in the city, presumably about as high as 5A might be expected to go, for it is in

less than one unit of the sixth grade standard. It is approached only by the score of School IV. It shows the highest increase in number of units save School II, but that school had a much larger potential increment because of the unusual smallness of its January score.

TABLE XXV

Scores in Comprehension for the 5A Grades of the Five Schools

	Schools				
	I	II	III	IV	V
May score	18.5	15.1	13.6	18.1	15.85
January score	12.7	8.65	12.4	14.6	10.45
Gain	5.8	6.45	1.2	3.7	5.4

In the class work during the term the pupils were tested every few weeks as to rate in words per second. This was done in two ways. Either the pupils would read for exactly a minute, or they would read a limited passage and rise as they finished, while the instructor, beginning when the first pupil rose, called time at five second intervals. After they had figured out the rates the pupils wrote them in the backs of their books. The records as made on the first, fourth, eighth, thirteenth, and fifteenth weeks are shown in Table XXVI. In this table also are given the January and May scores of each pupil who took the tests, together with the percentage of increase in both rate and comprehension. All of them save three show a percentage of increase in comprehension equal to or greater than that of rate, and these three show only small differences in favor of rate. This is due, no doubt, to the fact that, in practice, interpretation and retention were persistently insisted upon.

The first twelve cases in the table were so placed because their rates for the different weeks seem to show a real increase of speed. It should be explained here that the matter upon which the rates were figured was not always of equal difficulty. It is recalled that the matter used in the fifteenth week was more familiar than that used in the thirteenth. This is reflected to an extent in the rates shown for those weeks. A glance at the column for percentage of increase in rate as shown by the May test will reveal that this group contains more large increases than the rest of the table.

Cases thirteen to sixteen show a decrease in rate throughout

the weeks of the term. These children, fast readers to begin with, found it necessary to slow down in order to digest and hold the

TABLE XXVI

Reading Rates—5A Grade—School I

Pupil	1st Week	4th Week	8th Week	13th Week	15th Week	Jan. Rate	May Rate	Per cent Imp.	Jan. Comp.	May Comp.	Gain	Per cent Imp.
1	3.1	4.7	3.1	....	4.4	87	95	9	13.4	14.7	1.3	9
2	3.6	3.7	3.9	3.9	4.8	....	95	....	....	15.0	....	....
3	2.2	2.2	3.5	3.6	3.7	67	103	53	12.4	19.8	7.4	59
4	3.4	4.7	6.3	4.5	6.6	87	95	9	18.5	18.2	−.3	−1
5	2.2	4.4	3.2	3.3	3.5	44	69	56	5.6	11.8	6.2	110
6	2.7	3.3	3.3	2.8	3.6	67	123	83	11.7	19.6	7.9	67
7	2.4	4.4	3.6	4.4	3.5	76	76	0	13.7	12.5	−1.2	−8
8	2.4	2.7	3.3	3.8	2.6	31	52	67	2.6	8.0	5.4	207
9	2.3	2.6	2.1	2.5	4.7	....	103	....	....	19.8	....	....
10	3.2	3.0	3.1	3.9	3.9	....	103	....	....	23.2	....	....
11	1.7	1.8	1.8	2.4	2.0	44	61	38	5.5	11.3	5.8	105
12	4.2	4.3	4.4	3.8	4.5	....	....	....	....	....	....	....
13	4.4	4.1	4.5	3.7	4.2	....	123	....	....	18.5	....	....
14	4.4	4.1	2.3	3.2	4.6	98	123	25	18.4	24.6	6.2	33
15	4.6	5.5	5.4	4.1	3.8	141	123	−12	18.3	18.7	0.4	2
16	5.2	4.7	4.3	4.2	3.6	87	103	18	14.7	19.5	4.8	33
17	1.6	1.6	1.7	1.2	1.7	44	68	53	6.9	13.6	6.7	97
18	2.1	2.1	2.1	....	2.1	....	36	....	....	6.3	....	....
19	2.7	2.3	2.7	2.5	3.6	76	103	32	13.4	23.2	9.8	70
20	....	4.4	5.9	5.4	3.8	67	95	41	12.4	20.6	8.2	66
21	3.3	5.0	3.0	....	4.7	76	103	35	13.0	17.4	4.4	33
22	4.7	5.1	2.3	4.1	5.5	87	123	41	18.5	29.5	11.0	59

matter read. This group shows smaller increase in rate in the May test than any of the other groups, but their scores in comprehension are all on or above the median. Cases 17 and 18 were unsolved by the instructor. It seemed that nothing could make them increase their rates. Both were of the motor type; but, although lips would be held tight at command, and they tried to form the habit of reading without motor accompaniment, their rates did not increase. A little urging caused great confusion in number 18, and affected number 17 similarly, but in less degree. Number 17 was a much better student than number 18, and was a thoroughly conscientious worker. It is to be noted that, although her rates through the term show little increase, her May test shows a most satisfactory improvement in both speed and comprehension. The daily drill evidently had its good effect upon her. Cases 19 to 22 do not fit into any of the other groups. Their improvement in both rate and comprehension in the May test is encouraging, with the greatest increase in comprehension, save in one case Number 19 made a gratifying improvement in comprehension. Since she seemed to have very small

ability to get meaning from the printed page during the first weeks of the term, the instructor gave her a good deal of attention. Steady improvement was noticed during the term, and was certified later by her May score. Similar attention was given to number 1 because of like symptoms, but without result.

CHAPTER VI

SUMMARY AND SUGGESTIONS

In order that any interested supervisor or teacher who wishes to make a study of this sort in his own school may find it easy to follow or modify the plans used in this investigation, a summary of the steps is given in this chapter, together with some suggestions which may prove helpful. The details of diagnosis and prescription as described in Chapter IV are not reiterated, but several illustrative diagnoses are made, and a further discussion of the perception and eye-movement tests is given.

SELECTION OF POOR READERS

The first step is to give the Monroe silent reading test. The papers should be graded in accordance with the printed instructions in order that the scores may be compared with the published standards. From each grade to be studied three groups of papers should be chosen. The first group will be composed of papers from pupils noticeably below the median in comprehension. This group will probably include about one-third of the total number of papers from the grade. If the grade is divided into low and high sections, it will be found best to deal with each section as a separate grade. However, the standard scores are published for whole grades, and for this reason the papers for the half grades should not be separated until after the median for the whole grade is computed. The other two small groups are made up of those papers whose scores are unusually high and those whose comprehension scores are low in comparison with their rate scores. These selected papers should then be scored a second time for comprehension, and a more liberal method used. That is, the pupil should be given full credit in every case where his answer shows that his interpretation is correct, even if, for instance, he has underscored the word where he should have encircled it. At this second examination a score for index of comprehension should be marked. This may be simply a fraction, such as "$\frac{3}{4}$" when the pupil answered three questions out of four attempted. If it is preferred, for the sake of a uniform denominator, the fraction may be expressed as a percentage.

Interpretation of Data from the Silent Test The second step is to prepare the class sheets and record upon them the name, age, and grade of the pupils and the scores of each in comprehension and rate. Blank columns should be left on the class sheet for recording other data. Model class sheets are presented later. After the class sheets are prepared, the interpretation of each pupil's condition, in accordance with the chart of interpretation on page 50, is to be recorded in the appropriate column.

Diagnosis

The Oral Test The next step is to give the Gray oral reading test to all the children whose names appear upon the class sheet, save those whose silent scores show unusual ability. The giving of the oral test is a little intricate, and will require some practice upon other pupils before those whose scores are desired are tested. The oral examiner should observe the pupil carefully and make written comment of anything which may help the investigator in diagnosis. These comments may refer to indications of eye trouble or nervousness, disturbed breathing, and the degree of intelligence shown by the expression. In computing the pupil's oral rate, it is suggested that paragraph three be used for third grade children rather than paragraph four, which was used in this study. Either paragraph four or five may be used for the fourth grade, and paragraph five or six for the sixth grade. The easier paragraphs present a somewhat less rigid standard, but in this study the more difficult paragraphs did not appear to be too severe. With the oral score and rate recorded upon the class sheet, the examiner may proceed with the individual diagnosis in accordance with the diagnostic chart on page 55. In this connection it will be found helpful for the investigator to examine each oral test sheet. Diagnoses which are found difficult may be left until the perception or eye-movement tests are given. In all cases space should be left on the class sheet, or the possibility of erasure should be provided for, so that the recorded diagnosis or suggested training may be changed if the data from either one of these later tests demand it.

The Perception Test The span of perception test, as described in Chapter IV, requires little time to give or to score. Those pupils who require flash-card practice or rapid silent reading of easy material for increase of perceptual span may be easily chosen

by means of the returns of the test. If the investigator wishes to make a fuller study of the returns of this test, in comparison with the oral rate and score, it is suggested that the various data be arranged as shown in Table XXVII. This table shows records for the pupils of the fifth grade referred to in Table VII. The pupils are listed in three groups according to the greatest number of words read at any one exposure in the perception test. Within these groups they are arranged in the ascending order of their rates. An arrangement of this kind allows easy comparisons of the data of the two tests for each individual pupil and of the records of one pupil with those of another.

As illustrations the following comparisons may be noted: The difference in reading ability between M. J. and A. M. or S. A. lies chiefly in the span of perception. Their oral rates and scores and the number of exposures missed in the perception test are practically the same. But M. J. read only 28 per cent of the words in the perception test, while A. M. and S. A. read 39 per cent. The difference is accounted for when it is noted that the last two can read as many as four words at a single exposure while the first can read only three. The same effect of the perceptual span is noted in comparing W. E. with S. H. or J. P. With an oral rate of 2.7 and a high score of 60, W. E. should have read a greater percentage of words than either of the others, who had lower rates and scores. Yet his percentage of 48 is the same as

TABLE XXVII

Fifth Grade Records—Oral and Perception Tests

Names	Oral Scores	Oral Rate	Greatest Number of Words Read	Per Cent of Words Read	Lines Missed
M. E.	39	1.7	2	22	7
C. E.	12	2.0	2	33	1
H. J.	47	2.5	2	16	8
B. W.	11	1.8	3	34	0
M. J.	51	2.0	3	28	3
W. E.	60	2.7	3	48	0
G. M.	39	1.9	4	44	0
A. M.	50	2.0	4	39	2
S. A.	50	2.2	4	39	3
S. H.	51	2.3	4	48	0
J. P.	32	2.4	4	48	1
R. M.	45	3.0	4	47	0
D. E.	63	3.0	4	48	3

theirs, plainly because he was able to read only three words at a single exposure, while S. H. or J. P. could read four. The entire missing of exposures in any of these cases is perhaps due to inattention or a failure to have the eyes properly focused at the time of the exposure. Those pupils who read as many as four words for two or three exposures probably could not profit by flash-card practice. The need of word study of some character is shown by the oral rates or scores of all except H. J., W. E., R. M., and D. E. These same data show that the chief emphasis should be placed upon quantitative silent and oral reading in the cases of M. J., A. M., S. A., and S. H., while in the cases of C. E. and B. W. the emphasis should be upon oral accuracy.

Observations of Eye-movements The observations of eye-movements by an intelligent and careful person offer an opportunity for a closer scrutiny of the reading process of an individual pupil than any other form of observation or test. It will require considerable preliminary practice before it can be done well, but the time spent in practice is well rewarded. Such observations should

CHART X

Eye-Movement Record

Name **W. G.** Age..... Grade **6A** Type of Reading **Silent**

	No. of Pauses	Number of Regressive Movements
Line 1.....	8	.....
Line 2.....	9	.....
Line 3.....	11	.....
Line 4.....	10	.....
Line 5.....	11	.....
Line 6.....	11	.....
Line 7.....	9	.....
Line 8.....	8	.....
Line 9.....	9	.....
Line 10.....	4	.....

Length of Pauses

Short	Long	Very Long
.....	.....	Yes

be made at least of pupils whose diagnosis is difficult. As illustrations of the advantage to be gained from the close observation afforded, the eye-movement record sheets of W. G. and B. L. are shown in Charts X and XI together with the comment of the observer. The comments in these two cases, as may be readily seen, were very illuminating.

The comment on W. G. shows that she needs an easier type of reading, and careful, individual, sympathetic training in comprehension. The comment on B. L. shows that she seems to be habituated to short eye-movements and that it will perhaps be hard for her to break the habit. She is recommended for training by means of very easy and interesting reading. Her short eye-movements are probably one cause of the fatigue which she exhibits. The returns from her silent reading test show that if she can be trained into the eye habits of rapid silent reading she will make a very efficient reader.

CHART XI

Eye-Movement Record

Name **B. L.** Age..... Grade **5A** Type of Reading **Silent**

	No. of Pauses	Number of Regressive Movements
Line 1.....	.....	.....
Line 2.....	10	.....
Line 3.....	9	.....
Line 4.....	10	.....
Line 5.....	9	.....
Line 6.....	10	.....
Line 7.....	12	.....
Line 8.....	12	.....
Line 9.....	10	.....
Line 10.....	13	.....

Length of Pauses

Short	Long	Very Long
.....	.....	Yes

Remarks:

Seems very nervous, as if afflicted with palsy. Grows more nervous with more reading. Pauses very long and irregular. Poor interpretation—gets it in parts. Says pupils laugh when she reads in class.

Remarks:

Does not increase span with practice, but decreases length of pauses. Always stops with a sigh as if fatigued. Says it hurts her eyes to read without glasses. She did not have glasses at the time this reading was done.

Model Class Sheets

The model class sheets referred to previously are presented in Charts XII and XIV, while the remedial sheets made up from them are shown in Charts XIII and XIV. These charts are from one of the schools in which diagnosis was first attempted, and are shown as they were actually used, save that some of the crudities have been eliminated and one or two improvements made. In addition to the columns shown in the former class sheet a column is added for the data from the eye-movement test and a column for comments. In the oral column the upper number is the rate in words per second, and the lower number is the score. In the perception column, headed "span," the first number is the percentage of words read correctly, the second is the number of exposures missed entirely, and the third is the greatest number of words read in any one exposure. In the eye-movement column the top figures mark the average number of pauses in a line; the letters S, L, or V stand for short, long, or varied pauses; while the bottom figures indicate the number of regressive movements in a line. In the column for comments the following abbreviations are used:

Noted by observer of eye-movements.

Mo—Lip movements or other motor accompaniment of silent reading.

Ir—Irregular eye-movements.

Noted by examiners of oral reading or eye-movement.

Br—Disturbed breathing.

Eye—Suspected eye trouble.

Shown by the face of the oral or perception test papers.

Sub—subjective, indicating a word guesser.

S. V.—Small vocabulary.

O. I.—Oral inaccuracy.

In the column for interpretation and suggestions, the top line is the interpretation made after the silent test and before the returns from the other tests were at hand.

CHART XII

Model Class Sheet—3rd Grade

Names	Grade	Rate	Comp.	Oral	Span	Move-ments	Com-ments	Interpretation—Suggestions
Class Median...	3rd	44	6.8	46	.....	.....	.....	
12				1.3	.27	9.5	mo.	Poor ability.
					5	L	Eye	Tr. in recog. and comp.
N. C.....	3A	15	1.3	0	2	0.1	.....	Q. P.
8				1.3	.21	10.4	Ir.	Poor ability.
					7	V.		Tr. in recog. and comp.
T. L.....	3A	31	1.4	4	3	0.2	.....	Q. P.
9				1.4		9.8	Ir.	Slow reader.
						E		Tr. in recog.
B. E.....	3A	22	2.6	19	.....	0.2	.....	Q. P.
					.12		Eye	Slow reader.
					10			Tr. in recog.
G. R.....	3B	37	4.0	.....	2	.....	.....	Q. P.
8				3				Slow reader.
R. F.....	3A	31	4.0	52	.....	.....	.....	Tr. in Silent Speed.
				2	.19			Slow reader.
					10			Tr. in recog and silent speed.
C. B.....	3A	37	4.0	53	3	.....	.....	Q. P.
8					.45	10.5		Poor comp.
					5	L		Tr. in recog. and comp. and silent speed.
A. M.....	3A	44	4.2	.....	5	0.5	.....	
				2.4	.30		O. I.	Slow reader.
					4			Tr. oral acc. and silent speed.
M. C.....	3B	31	5.3	28	4	.....	.....	
14				2	.17		S. V.	Slow reader.
					11			Tr. in recog.
C. L.....	3A	31	5.3	31	3	.....	.....	Q. P.
7				2.7			O. I.	Careless.
								Tr. in comp.—Tr. in oral
S. C.....	3A	127	6.9	61	.....	.....	.....	acc.

CHART XIII

Model Remedial Sheet—3rd Grade

Eyes examined
N. C., G. R.

Intensive training in word structure
N. C. (QP)
T. L. (QP)
B. E. (QP)

Increased vocabulary
G. R. (IP) C. L. (IP)
C. B.
A. M.

Accurate recognition
M. C.
S. C.

Accuracy of interpretation
N. C., S. C.
T. L.
A. M.

Silent speed and quick interpretation
R. F., M. C.
C. B.
A. M.

CHART XIV

Model Class Sheet—Fifth Grade

Names	Grade	Rate	Comp.	Oral	Span	Movements	Comment	Interpretation—Suggestions
Class Median...	5th	76	16	48	.....	.....	.....	
10				2.4	.34		Sub.	Poor ability.
					6			Tr. in recog., oral acc., comp.
H. M.....	5A	44	5.6	40	3	.....	.....	Q. P. Silent speed.
10				1.6	.36	9	O. I.	Slow reader.
					3	L	Eye	Tr. in recog., oral acc.
B. L.....	5B	44	6.9	25	3	0.3	.....	Q. P.
				2.3	.18			Poor ability.
					8			Tr. in recog. and comp.
P. E.....	5A	59	7.2	38	2	.....	.....	Q. P.
				2.3	.39		Sub.	Poor comp.
					1			Tr. in recog., oral acc. and
M. M.....	5B	67	7.7	32	3	.....	.....	comp. Q. P.
11				2.4	.70	5.2		Slow reader.
					0			
T. G.....	5A	54	72	48	5	0.5	.....	Tr. in recog. and silent speed.
11				2.0	.36	9.5	Ir.	Poor comp.
					2	L	Ner-	Tr. in recog. and comp.
W. G.....	5B	67	9.6	43	3	3	vous.	Q. P. Careful individual Tr.
11					.31	9		Slow reader.
					3			Tr. in recog.
B. M.....	5A	59	9.0	.....	3	0.4	.....	Q. P.
10				3	.80	6.2		Slow reader.
					0	S		Tr. in silent speed.
D. L.....	5A	67	11	68	5	1.1	.....	
	5A	59	11.7	1.4	.30	10.5	Eye	Slow careful reader.
				36	2	L	Br.	Tr. in recog., oral acc.
L. B.....					4	0.4		Q. P.

CHART XV

Model Remedial Sheet—5th Grade

Eyes examined
B. L. L. B.

Intensive training in word structure
B. L. (QP)
L. B. (QP) (Breathing)

Increased vocabulary
H. M. (QP) M. M. (QP) W. G. (QP)
P. E. (QP) T. G. B. M. (QP)

Accurate recognition
H. M. M. M.
B. L. L. B. (Much very easy and very interesting reading as rapidly as possible)

Accuracy of interpretation
P. E. W. G. (careful treatment)
M. M. H. M.

Silent speed and quick interpretation
T. G. D. L.

Examples of Diagnosis and Prescription

An explanation of several of the diagnoses may serve to show more clearly the light thrown on the problem by the different tests. In the third grade T. L. shows poor ability, for he did not read much matter and interpreted what he did read very poorly. His oral, perception, and eye-movement tests are at one in showing that his word recognition is very faulty. Consequently, training in recognition and comprehension is prescribed for him, together with training by short-exposure methods. (Q. P.) On the remedial sheet he is listed for intensive training in word structure, since his oral rate and score show that he is in need of very fundamental training. The silent reading scores of A. M. show that he is poor in comprehension. He did not take the oral test, but the fact that he suffers from faulty recognition is shown by the 10.5 long pauses to the line noted in the eye-movement test. However, he is quick to recognize easy words that he knows, for he read as many as five words at a single exposure in the perception test. He needs no short exposure drill, but he does need a study of words to increase his vocabulary of recognition, and a training in accuracy of interpretation. It was felt also that a training in speed of silent reading would aid in reducing the number of eye-movements to the line, which seem entirely too many for a pupil whose span of perception is as great as his. S. C., with a very high rate but a very moderate comprehension score, is listed as a careless reader. His oral rate and score show that carelessness is really his trouble, while an examination of his oral sheet shows an

inaccurate calling of words which he really knows. Accordingly, training in accurate recognition and in accuracy of interpretation is prescribed for him.

The interpretation of the data upon D. L., as shown in the fifth grade sheet, was explained in the discussion of the eye-movement test. H. M. showed poor ability as a reader in the silent test, with a low rate and an imperfect score in comprehension. His oral rate and score, while not up to standard, would warrant a better silent rate than he employed; consequently, he is listed for special attention in the speed drills as well as in the comprehension drills. His oral showing is good enough to put him in the increased vocabulary list; but he is marked for training by short-exposure methods, since he does not make a good score in the perception test. The silent-reading scores of B. L. are practically those of the third grade, and she is accordingly marked a slow reader. The reason for her slowness is shown in the very low rate and score from the oral test. This diagnosis of faulty word recognition is confirmed by the evidence from the eye-movement test. Inaccuracies were noted on her oral test paper, and a difficulty in focus was noted by the observer of her eye-movements. Prescriptions made in accordance with these data are indicated in the column for suggestions, and are made definite to the teacher on the remedial sheet. T. G. is a slow reader, when her rate of 54 is compared with the class median of 76. If her paper had been more liberally scored in comprehension, her score of 72. would have been raised to a more respectable figure. Her slowness does not seem to be due in great degree to faulty recognition, for her oral rate is only a little bit under the rate of easy, automatic reading, and her score is exactly the standard for that grade. Moreover, the data for both the perception and eye-movement tests show that her perceptual span is excellent, her recognition quick, and her eye-movements of a type to be expected of pupils of her age and grade. Since her oral rate and score are not equal in excellence to the excellent showing of the perception and eye-movement tests, a somewhat small vocabulary of recognition is inferred. Consequently, her name is placed in the increased vocabulary list. However, she is recommended particularly for training in speed of silent reading, for that seems to be equally needed.

Remedial Training

After the diagnosis, the next step is to begin appropriate training under the teachers. This training work should be organized in small groups of four to six pupils if it can be managed. It will be found worth while to put into the hands of the teacher, in addition to the class and remedial sheets, a typewritten description of the remedial practices to be used, such as is shown in the passage on remedial practices at the end of Chapter IV. The teacher must be allowed latitude in varying the training, particularly when her judgment dictates a change after a close scrutiny of the results of the training prescribed. Frequently a teacher's opinion that is at variance with the diagnosis will change after she herself has given the pupil tests. Silent and oral tests to check improvement of the pupils should be made every few weeks; and if the teacher assists in giving, scoring, and studying these, the remedial training will be all the more intelligently conducted.

BIBLIOGRAPHY

1. Brown, H. A., *The Measurement of Ability to Read,* Bulletin No. 1, 1916, Bureau of Research, Department of Public Instruction, Concord, N. H.; "Measurement of Efficiency of Instruction in Reading," *Elementary School Teacher,* XIV (1914), 477-490.

2. Bryner, Edna, "Selected Bibliography of Certain Phases of Educational Measurements," *Seventeenth Yearbook, National Society for the Study of Education,* Part II, 1918, 174-177.

3. Courtis, S. A., *Courtis Standard Research Tests, Silent Reading Test No. 2.* Detroit, Mich.

4. Fordyce, Charles, *A Scale for Measuring the Achievements in Reading,* The University Publishing Company, Lincoln, Neb.

5. Gray, C. T., "Types of Reading Ability as Exhibited Through Tests and Laboratory Experiments," Supplementary Educational Monographs, Vol. I, No. 5, University of Chicago Press, Chicago, Ill.

6. Gray, W. S., "Studies of Elementary School Reading Through Standardized Tests," Supplementary Educational Monographs, Vol. I, No. 1, University of Chicago Press, Chicago, Ill.; "Methods of Testing Reading I," *Elementary School Journal,* XVI (January, 1916); "A Study of Emphasis on Various Phases of Reading Instruction in Two Cities," *Elementary School Journal,*

XVII (November, 1916), 178-186; "Use of Tests in Improving Instruction," *Elementary School Journal,* XIX (October, 1918), 121-142; "A Cooperative Study in Reading in Eleven Cities in Northern Illinois," *Elementary School Journal,* XVII (December, 1916), 250-265.

7. Jones R. G., *Standard in Mechanics of Elementary Reading,* Lakewood, Ohio.

8. Judd, C. H., "Studies of Reading," Chapter VII in "Measuring the Work of the Public Schools," *The Survey Committee of the Cleveland Foundation,* 1916, 124-161; "Reading: Its Nature and Development," *Supplementary Educational Monographs,* Vol. II, No. 4, University of Chicago Press, Chicago, Ill.

9. Kelly, F. J., *The Kansas Silent Reading Test,* Emporia, Kan.; "The Kansas Silent Reading Tests, *Journal of Educational Psychology,* VII (1916), 63-80.

10. Monroe, W. S., "Silent Reading," *Second and Third Annual Reports of Bureau of Educational Measurements and Standards,* Chapter IV, Kansas State Normal School, Emporia, Kan.; *Standardized Silent Reading Test,* Emporia, Kan.; Monroe's Standardized Silent Reading Tests," *Journal of Educational Psychology,* IX (June, 1918).

11. Price, E. C., *Practical Oral Reading Tests.* Enid, Okla.

12. Starch, Daniel, "Measurement of Efficiency in Reading," *Journal of Educational Psychology,* VI (1915), 1-24; *Educational Psychology,* The Macmillan Company, New York.

13. Thorndike, E. L., *Thorndike's Scale Alpha for Measuring the Understanding of Sentences: Scale Alpha 2, Parts 1 and 2.* New York City.

14. Uhl, W. L., "The Use of the Results of Reading Tests as a basis for Planning Remedial Work," *Elementary School Journal,* XVII (September, 1916), 266-275.

15. Zirbes, Laura, "Diagnostic Measurement as a Basis for Procedure," *Elementary School Journal,* XVIII, 1 (March, 1918), 505-522.